THE IRON AGE

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Artistry in Metal

By DeW. ENDICOTT*

ORNAMENTAL iron, in centuries past a favored medium of artists, has been revived since 1900 from near extinction and has in more recent years developed an extraordinary vogue. Two factors are responsible. First is the convenience of modern oxy-acetylene cutting and welding equipment, with which the skilled workman easily executes designs impossible for his predecessor with only a forge and anvil. Second is the impetus of modernistic decorative art, which within the last three or four years has found unusually pleasing and unapproachable effects by using metal and alloys in various forms.

Antique pieces of great beauty are treasured in museums. They were fabricated by a very laborious method. First the small details—a twig, a leaf, a bird feather—would be shaped from hot iron. Then it and the portion of the completed design to which it was to be attached would be heated in a forge to a scintillating heat and hammered together on an anvil. Such continued reheatings not only limited the delicacy and sharpness of the traceries, but the whole design had to be made to conform to the limitations of anvil welding. Sometimes necessary joints had to be pinned together—the only practicable manner. Naturally the work required much exacting labor from men of the highest patience and skill.

With the coming of the machine age, such artisans became fewer and fewer. Fortunately, however, the flexibility of the new manufacturing processes was able to replace the skill required in olden days. Designs calling for the most complicated arrangement of joints can easily be executed by fusion welding; the localized heat of the blowpipe flame preserves the finest edges and makes joints which have the sought-for appearance of the older hand work. As a matter of fact the crude appearance of many of the best antiques was not caused by any desire on the part of the artist, but was due rather to the limitations placed on

*Technical Publicity Department, Linde Air Products Co., New York.

are made and sold every month. The more imposing pieces illustrated in this article are made to order, worked to individual designs furnished by the architect or decorator, and delivered according to contract schedule.

The variety is truly remarkable. Hand-wrought porte-cocheres for private residences, balcony railings and large ornamental iron arches must have not only artistic merit but also the strength inherent to welded metal and the corrosion resistance of genuine wrought iron. The interiors of large buildings, however, are affording the ornamental iron shops their greatest opportunity. Large grilles, gates and mural designs for hospitals, libraries, municipal buildings, theaters, and other buildings of a semi-public nature are among the many pieces of large size which are being fabricated.

The speed and efficiency with which it is done today, as compared to a century ago in no way lessens the artistic merit of the finished product. This, of course, primarily depends on the creative artist; in fact, the blowpipe is capable of executing work of greater merit than has hitherto been possible—it removes the mechanical limitations.

It is obvious to anyone who is acquainted with fusion welding that the cutting blowpipe can be used to rough out irregular shapes prior to forging them to closer dimension, or even to give a rippled edge to lock plates or silhouetting solid masses in heavy iron. Intricate designs such as leaves and flowers are

him by the laborious methods available at the time.

With the method available for making the joints, many metal working firms have been able to go into fairly steady production in art objects required by modernistic decorators. Nearly everyone is familiar with metal andirons, colonial hardware (hinges, knobs, and so on) and floor lamps. Thousands of these

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HARMONY AND BEAUTY

WROUGHT iron workers, artists and architects, working in cooperation, are not only able to construct porte-cocheres, entrance doors and balcony railings in perfect harmony with each other and the building they ornament, but also to create screens using conventional grape vine and other motifs which will bear the closest inspection without revealing the presence of welded joints.

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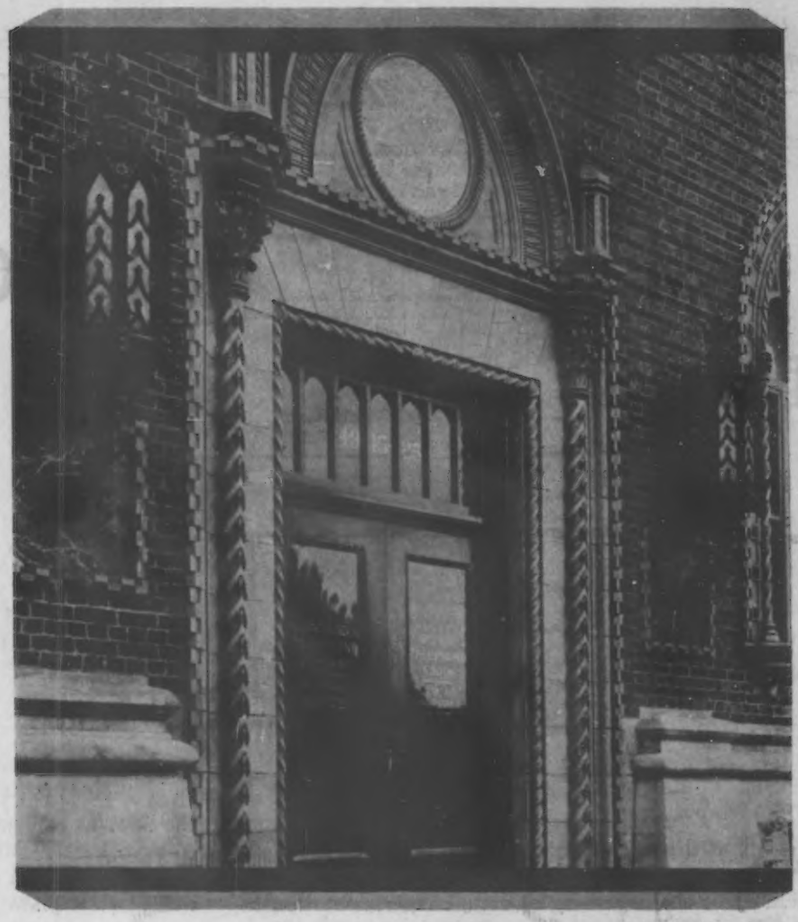
often roughed out with the cutting blowpipe, then local areas are heated with the welding blowpipe and are hammered into the finest details. Most elaborate as well as minute figures are cut from the base metal and subsequently worked by means of the oxy-acetylene process.



The welding blowpipe is able to produce localized heat in places which it would be impossible to reach by any other means. Invisible joints make the finished product appear as one piece. Steel or Norway iron welding rod is usually employed for joints which will be the same color as the parts connected. On a concealed joint or a joint where a difference in color will be acceptable high-strength bronze welding rod is more convenient. With it the artist-welder is not impelled to heat the parts past the melting point; when iron or steel has reached dull red it is hot enough for the bronze rod to flow perfectly and produce a sound joint. Such a bronze weld not only possesses great strength but does not mar any sharp edges, and will penetrate between tight fitting metal shapes. In some cases of this sort, a fusion weld would be impossible, as the heat required to make it would either distort or melt the objects being joined.

Another great advantage of the oxy-acetylene process in the construction of modern ornamental iron, is that it is able to make sound, strong joints in all the other modern metals. The ancient worker was confined to the easily welded wrought iron. The modern artisan can work in copper, brass, bronze, Monel metal, aluminum, stainless steel—even silver and gold—wholly independent of the older limitations requiring the making of weak soldered joints, pinning the parts together with a less satisfactory mechanical joint, molding and casting the parts to shape, or working a cold sheet of metal to form by hammering or spinning. Removed from these limitations, the construction of intricate designs from simple elements has enabled the artist to express his ideas freely.

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RUGGEDNESS AND DELICACY

AN artist could hardly ask for a better medium than gas-welded ornamental iron, capable on the one hand of expressing solidity, ruggedness and storm resistance—as the wrought iron lamps flanking the entrance of a commercial house—and yet such that the utmost delicacy of peacock feathers can be suggested. Sharp edges, thin leaf-like sections, and clean angles are all but impossible to preserve by the older method of anvil forging.

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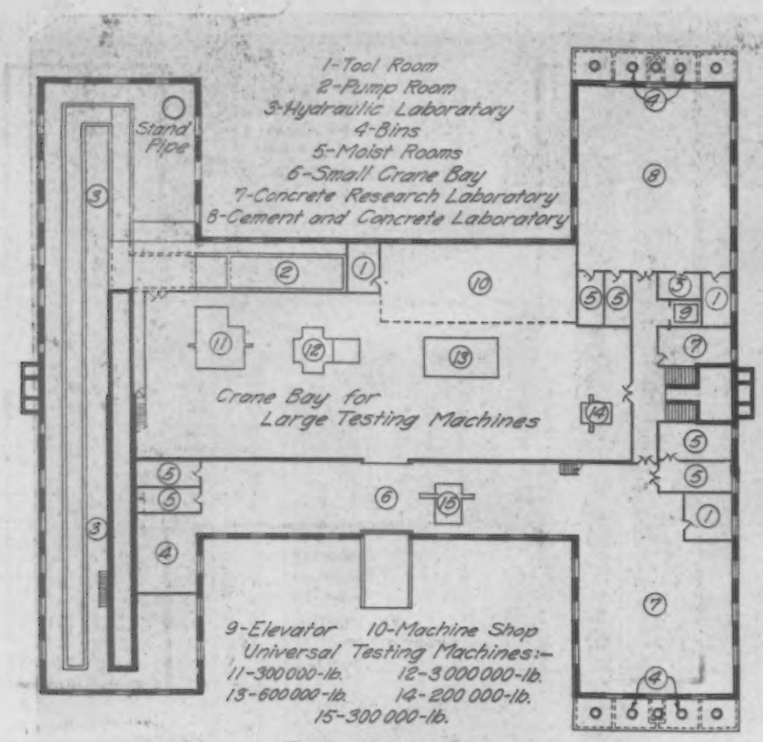
Illinois Commodious Testing



BASEMENT FLOOR PLAN

A NEW materials testing laboratory was dedicated at the University of Illinois May 2 as the main event in a celebration of the twenty-fifth anniversary of the beginning of actual experimentation in the Engineering Experiment Station at this institution. At the exercises addresses were made by Prof. A. N. Talbot, for many years director of the work in materials testing, and by David Kinley, president of the university. Guests were also conducted through the new, as well as the old, engineering laboratories. A new Emery-Tatnall 3,000,000-lb. testing machine was given its first specimen to break—a wide piece of welded steel plate, which broke with a very satisfactory bang at 1,325,000 lb.

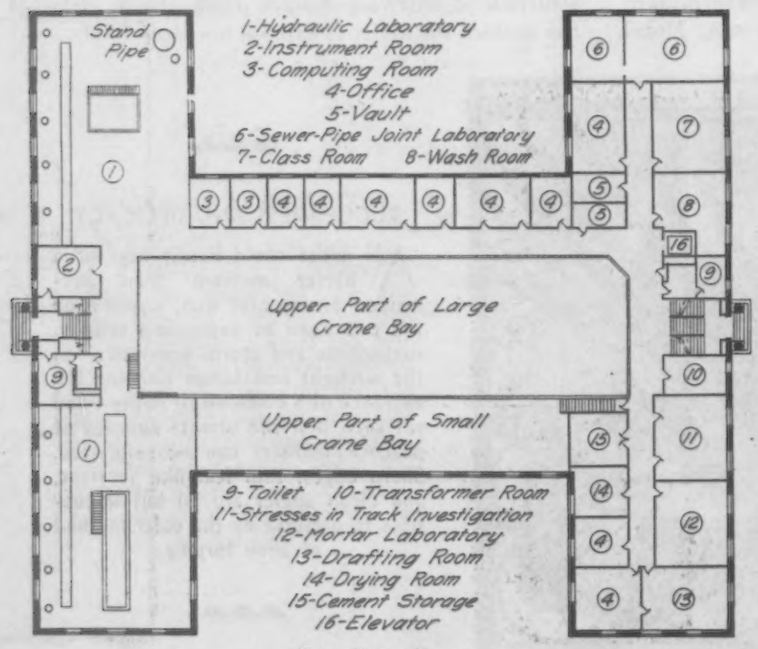
*Professor of engineering materials, University of Illinois, Urbana, Ill. Past president, American Society for Testing Materials.

The Materials Testing Laboratory

THE new materials testing laboratory is a four-story brick building of a modified Georgian design. The plan is in the form of an H, with two wings 50 x 187 ft. and a stem 92 x 110 ft. It contains the laboratories of the departments of civil engineering and theoretical and applied mechanics, and a number of offices and classrooms. The building has a structural steel frame, reinforced concrete floors, partition walls of concrete block, and is fireproof throughout.

Occupying the central portion of the building to its full height is the large laboratory, a room 40 x 147 ft. in plan, where the heavy testing work is done. The whole area is served by a 10-ton traveling crane 50 ft. above the floor. As shown in the general view, the room is well lighted by steel sash windows covering the upper half of the entire north wall, and by an overhead system of fourteen 1000-watt lamps. The floor, at the basement level of the building, is made accessible to truck deliveries by a ramp and large service door at the south side of the building.

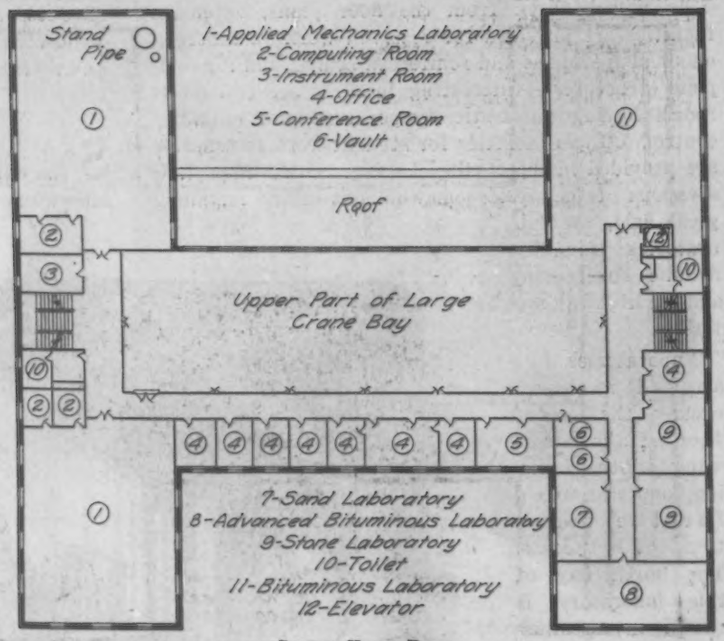
The Emery-Tatnall testing machine, which was built by the South-



FIRST FLOOR PLAN

Constructs Materials Laboratory

By H. F. MOORE*



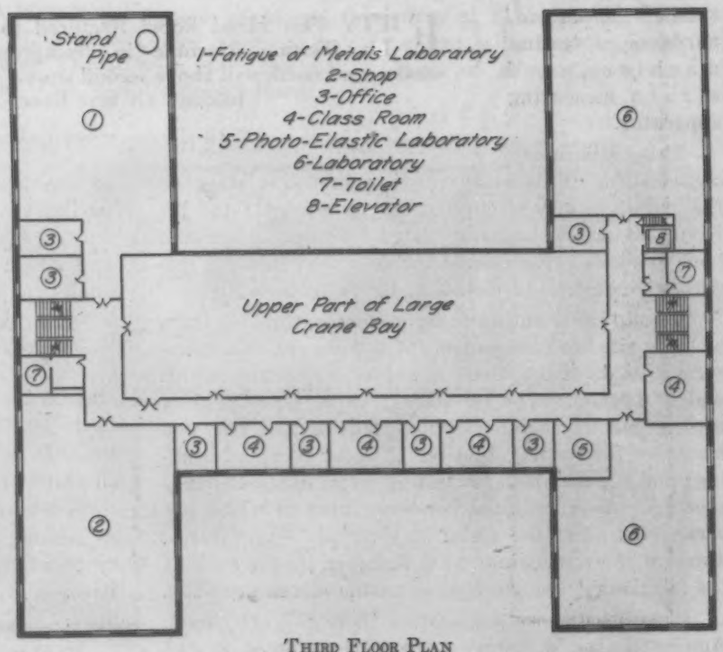
SECOND FLOOR PLAN

wark Foundry & Machine Co., Philadelphia, is shown in the background of the photograph. This machine, which ranks among the largest in the world, has a clear working space of 7 ft. 6 in. between screws, and will accommodate tension or compression test pieces up to a length of 38.5 ft. The machine extends 15 ft. below the floor and 49.5 ft. above it. It may be used in testing full-sized steel and concrete columns, masonry piers, steel cables, riveted and welded joints, eye-bars, car couplers, chord members of bridges and other heavy structural members.

The crane bay also contains a 600,000-lb. Riehle testing machine, which can take tension or compression test pieces of lengths up to 25 ft., a 300,000-lb. Riehle universal testing machine accommodating test pieces to a height of 20 ft., a 200,000-lb. Olsen universal testing machine, a 230,000-lb. Olsen torsion testing machine, and a Turner impact testing machine.

An unusual facility has been provided by making a part of the floor, 23 x 120 ft. in area, a heavily reinforced concrete slab 16 in. thick, which will serve as a testing base. Eighty steel inserts, each one containing an anchorage for a 2½ in. bolt, and capable of withstanding an upward pull of 50,000 lb., are placed in the slab in rows 6 ft. apart in both directions. With this provision, a structure may be built on the testing base and a testing frame built around it through which loads can be applied to the structure by means of hydraulic jacks or other similar apparatus.

ADJACENT to the large crane bay, and connected to it by a large doorway, is a two-story bay, 23 ft. wide and 112 ft. long, which is used for the preparation of specimens and testing. This is served by a 6-ton traveling crane, and is a part of the concrete and the structural research laboratories. A part of the floor is of reinforced concrete 12 in. thick, and provided with 42 inserts similar to those in the large crane bay, placed at 3-ft. intervals in rows 4 ft. apart, and each will withstand a 10,000-lb. pull. Much testing with these inserts will be done using calibrated hydraulic jacks. A 300,000-lb. Olsen universal testing

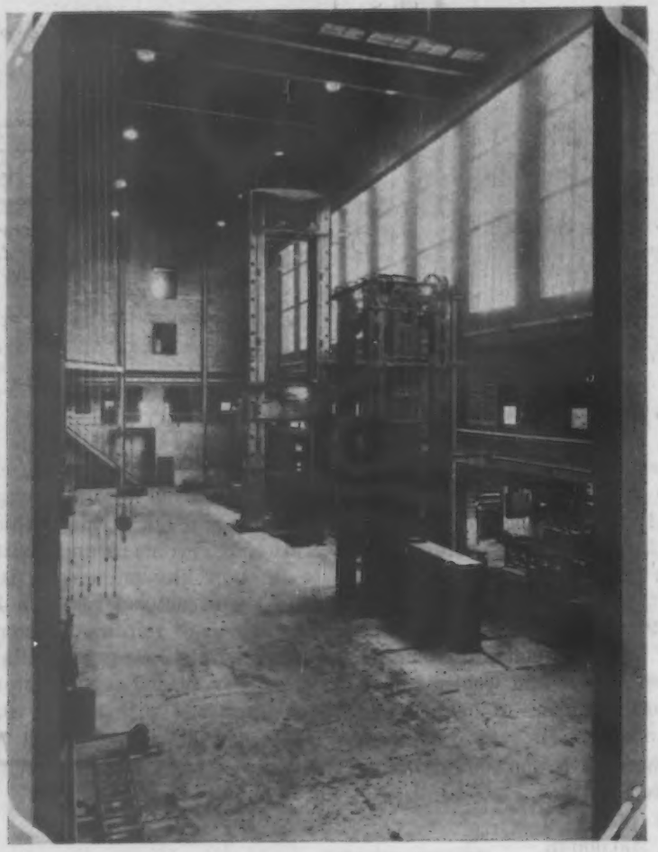


THIRD FLOOR PLAN

machine with a 22-ft. table is also used for beams.

As will be seen from the floor plans, extensive facilities are provided for research work on concrete, on small specimens and reinforced beams, and for complete structures. Interesting features are two moist rooms having automatic temperature and humidity control. Ample facilities for student work in concrete are provided in the northeast wing. Other important divisions of the work, somewhat out of the metallurgical field, are laboratories for hydraulic engineering and for highway materials.

Laboratories for applied mechanics occupy the second floor of the west wing of the building, and are used for the instruction of students. The north bay of this laboratory is shown in an illustration. It contains nine testing machines with capacities of from 50,000 to 200,000 lb., equipped with individual motor drives. In addition, there are a number of smaller hand-operated beam-testing machines, torsion machines, a special Olsen impact machine, several motor-driven testing machines of various types for testing small specimens, hardness testing machines, and strain measuring apparatus.



FIFTY Feet Head Room Required to Clear 3,000,000-Lb. Testing Machine in Background. Continuous windows on north wall above second story. Offices open from balcony on first floor

This laboratory occupies the third story of the northwest wing of the building, and is devoted to the study of the behavior of metals under repeated loading. A general view is shown. Equipment includes the following machines for testing of metals under fatigue loading:

Twenty-one rotating-beam machines, three of them of large size, and one capable of testing car-axle specimens 2 in. diameter; three machines for testing metals under repeated twisting stress; three machines for testing metals under repeated tensile loading; two machines for testing sheet metal under repeated bending; and six machines for testing metal in a stationary specimen under repeated bending, three of which are arranged to test the metal at elevated temperatures. Many of these machines were designed by the staff of the laboratory and constructed in the laboratory shop.

In addition to these machines there is a 100,000-lb. Amsler testing machine, a machine designed in the laboratory for testing sheet metal, and machines for hardness and impact tests of metals. There is also an electric furnace for heat treating, case carburizing and nitriding specimens.

Adequate Shops and Miscellaneous Services

SPACE for two well-equipped shops is provided in the building. The shop for the structural research laboratory is conveniently located in the basement, adjacent to the large crane bay. The shop for the research and student laboratories in theoretical and applied mechanics is located in the southwest wing on the third floor. Four mechanicians are employed in making specimens for research investigations and for student tests, in constructing apparatus, and in keeping the equipment of all laboratories in repair.

Delivery of heavy articles to the third-floor shop is by a large freight elevator, and by the 10-ton crane. A portable landing platform in one corner of the crane bay allows the crane to deposit its load at any floor level.

In the calibration room are kept the accurate standards of length and weight, with the necessary apparatus for calibrating and standardizing the ordinary equipment of the laboratory. A set of Johannsen blocks and auxiliary tools and a special calibrating apparatus may be used in checking and calibrating extensometers and strain gages. A precise Sealers balance and an analytical balance, together with a set of standard weights certified by the United States Bureau of Standards, permit the standardization of weights up to 50 lb. A Crosby fluid pressure scale is used as a standard of reference for pressure gages of capacities up to 10,000 lb. per sq. in. An Amsler standardizing box of 100,000-lb. capacity is provided for use in checking the accuracy of testing machines in the various laboratories.

Among the smaller laboratories is a dark room provided with apparatus for the investigation of stresses in transparent models by means of polarized light.

In other rooms space is provided for tests of flow

Strength of Materials Laboratory for Student Work Contains Many Machines of Moderate Capacity

of lead under continued loading, and apparatus for determining shearing stresses in non-circular sections subjected to torsion by means of the soap film analogy.

In addition to the laboratories there are offices in the building accommodating 35 members of the teaching and research staff, including the general office of the theoretical and applied mechanics department. A conference room is provided for department and committee meetings. There are five classrooms, five computing rooms and two instrument rooms used for student work. Two fireproof vaults are used to store department records and experimental data.

Interest in highly alloyed nickel-chromium steels, aroused by the growing use of this material in steam turbines, led to a study of their properties by Greulich and Bedeschi, *Stahl und Eisen*, No. 49, 1929. The steel analyzed 0.28 C, 0.15 Si, 1.88 Mn, 0.03 P, 0.03 S, 33.6 Ni, and 10.1 per cent Cr. Hardness, measured after cold rolling with a 36 per cent reduction, was 280 kg. per sq. mm. (398,000 lb. per sq. in.) It falls off inappreciably up to temperatures of about 650 deg. C. Beyond this point the decrease is marked. Notch impact and tensile strength also remained substantially constant up to 650 deg. C. Due to the high content of nickel, the steel is entirely austenitic, there being no temperature at which a conversion to martensite is noted. Up to 1100 deg. C., the grain size increases logarithmically with the temperature.

The separation of carbides from the austenite was first observed at 700 deg. C. It increases up to about 800 deg. C., but on further raising of the temperature, the particles tend to redissolve. It is shown that ductility is least in the range 700 to 800 deg. C., corresponding to a maximum of precipitated carbide. Similarly, the impact values showed a sudden drop at 1150 deg. C., coincident with the disappearance of all carbide areas.

INVESTIGATIONS on Fatigue of Materials, Which Have Been Under Way at Urbana for Several Years, Will Hereafter Be Conducted in This Well-Equipped Room

Advances in Aluminum Castings

Importance of Better Aluminum Foundry Practice Stressed at Cleveland Session—Progress in Die Casting and Furnace Refractories Also Discussed

THREE papers on non-ferrous founding were presented in a well-attended non-ferrous session at the annual meeting of the American Foundrymen's Association in Cleveland, May 12 to 16. This session was presided over by F. L. Wolf, Ohio Brass Co., Mansfield, Ohio.

How to Make Stronger Aluminum Castings

A PAPER that proved of much interest had as its subject, "Stronger Aluminum Castings by Improved Foundry Practice." This was prepared by T. D. Stay, E. M. Gingerich and H. J. Rowe, Aluminum Co. of America, and was presented by Mr. Gingerich. The paper discussed various factors of aluminum founding which, the authors said, must be studied to secure the best qualities in aluminum castings. Methods of testing were also outlined.

Knowing the functions of every casting, the foundryman, according to the authors, can control the different variables so that the strongest metal is in the section subjected to the maximum strains in service. For example, five castings can be made in five different ways and will have the same surface appearance, but physical tests and X-ray examination will show that no two have the same properties. Methods of determining physical properties or strength of castings include tensile tests on individually cast test bars, on test bars attached to the casting, on test bars machined from various sections of the castings and by breakdown tests on the casting.

Five Important Variables in Foundry Practice

The authors listed five general variables in foundry practice which may affect the strength of a casting. These are melting, pouring temperature, degree of chill imparted by the sand, the path taken by the metal through the mold after leaving the gates and the rate of solidification in the various sections. It was stated that, in the case of individually cast test bars or castings of simple design, the regulation of the variables is relatively simple, but for more intricate castings the control of the variables is more difficult. Individually cast test bars made in standard green sand molds without artificial chilling give the foundryman an accurate means of determining properties only when the metal is within the chemical specifications, properly melted and, in the case of heat-treated alloys, properly heat treated. While individually cast test bars do not show the strength of the castings, by knowing the physical properties of the test bars certain conclusions can be drawn regarding the properties of the casting.

Marc Stern, author of one of the papers, was formerly chief engineer of the Doehler Die Casting Co., Brooklyn

Castings Have 75 Per Cent Strength of Test Bars

Comparisons over a period of years show that test bars cut from castings from the same metal have a strength of 70 to 75 per cent of that obtained on the individually cast test bars. Owing to difficulty of controlling the temperature of the metal entering an attached test bar, the physical properties of the attached test bar may differ from those of the castings. To ascertain the true strength of the various parts of the casting, test bars should be machined from the casting. This method is important in the development of the casting technique, for, by properly placing gates, risers and chills, the sections that receive the greatest strains can be made the strongest. The breakdown test is of advantage to prove out the design of the casting. It gives both the manufacturer and the purchaser a better working conception of the strength of the casting than can be obtained from test bars.

Results of tests were given to show the relation between the properties of castings as obtained by the four methods. They indicated that test bars attached to castings do not always give correct information regarding the actual properties of the castings.

X-Rays Improve Foundry Technique

The value of radiographic examinations by means of X-ray photographs to disclose internal defects and determine soundness of castings was stressed. However, the chief value of radiograph, it was pointed out, is during the development of foundry technique. A study of radiographs will aid in telling whether the gates are properly placed and the effect of chills and risers on the porosity. This examination, together with physical tests made at the same time, gives the necessary information for improving the strength of a casting. Lantern slides showed

variation in porosity due to different methods of gating. One illustration showed that a change in gating resulted in a 50 per cent increase in the strength of the casting.

Some of the controllable variables in foundry technique were discussed. Pattern design should be studied, as changes may result in stronger castings. All cores should be vented. Patterns used for other non-ferrous metals and for iron often must be remodeled before they are satisfactory to use for aluminum alloys. Steps followed in the development of an aluminum alloy seat bracket casting to replace malleable iron of the same strength were illustrated.

Molding sand control was declared to be an important factor in producing good castings in an aluminum foundry. An ideal molding sand for aluminum alloys is one, it was stated, which combines high permeability, compressive strength, durability and fine texture. Low permeability and low green sand strength were given as causes of many defective castings. Such defects as cracking, shrinkage and hot shortness can be minimized by proper gating and use of risers and chills.

The authors also stressed the importance of proper melting and pouring temperatures. Aluminum alloy should be poured at as low a temperature as will fill the mold readily without causing cold shuts. For best results metal should be used shortly after it has reached the proper melting temperature. The effect of pouring temperature cannot be overestimated. Accurate control will result in better castings. The height of pouring has considerable effect on the soundness of the castings. No discussion followed this paper.

¶ In testing for the strength of aluminum castings it has been found that

1. Test bars attached to castings do not always give correct information on the actual properties of the castings;

2. To ascertain the strength of various parts of a casting, test bars should be machined from it;

3. Breakdown test gives a better working conception of strength than can be obtained from test bars;

4. Radiographs invaluable to the development of foundry technique.

¶ Pouring temperature for aluminum should be as low as possible without causing cold shuts.

¶ Ideal molding sand for aluminum castings combines high permeability, compressive strength, durability and fine texture.

¶ Field of die castings has been broadened by new casting machine.

¶ Zinc base alloys for die casting have been improved greatly through metallurgical control.

¶ Non-ferrous furnace linings are being made increasingly of silicon carbide, aluminum oxide, mullite and alumina-silica in place of fire clay refractories.

Die Casting Industry to Date

"PROGRESS of the Die Casting Industry" was discussed by Marc Stern, A. C. Spark Plug Co., Flint, Mich., who presented lantern slides to show the development of die casting machines. A machine recently brought out has a stationary ejector die and a movable cover die, which is a reversal of the common design. This is an automatic machine, controlled by one lever, and produces six to seven complete castings a minute. The author said that this machine has broadened the field for die castings, because it can now be used for making parts that could formerly be made cheaper by other methods.

The author defined five processes of making castings in metallic molds—slush casting, permanent mold casting, centrifugal casting, pressed casting and die casting. While in the first four methods the metal is poured, in the die casting process it is forced into the mold under pressure. The castings made by the die casting process have sharper outlines, thinner walls, denser surfaces, are of more intricate design and have the advantage of accuracy in finish.

Development of Zinc and Aluminum Base Alloys

Tin and lead alloys were first used for die castings, but their field of application outside of bearings was limited. The demand for something harder led to the production of zinc base die castings, but casting troubles resulted and many of the castings had cracks. To overcome these defects haphazard alloying methods were resorted to, such as the addition of a little aluminum, copper or tin. Later metallurgical control of zinc base alloys was developed, resulting in marked progress in this industry.

Aluminum die casting was started commercially in 1914 and the selection of alloys from the standpoint of permanency was a comparatively simple problem, because of the experiences derived from the sand castings. Difficulties first met have been reduced by the proper selection of alloys, improved casting equipment and the use of alloy steels for die construction. Chrome-vanadium and chrome-tungsten are generally used for die steels. Die casting of brass so far, the author said, has not proved a commercial success in this country, the high cost of die maintenance offsetting the saving in the castings. The speaker emphasized the importance of gating, venting and water cooling dies.

Discussion

IN the discussion Mr. Stern said that zinc alloy die castings are now being made having a tensile strength of 50,000 lb. per sq. in. and sufficient permanency for all practical purposes. Zinc alloys of even greater permanency and physical properties are now in the process of development. Replying to questions, he said that with zinc, tin and other base metals, a plunger-type casting machine is more desirable than the gooseneck type and that it is satisfactory to use the same alloys for die castings as for sand castings. He mentioned No. 12 aluminum and silicon alloys as satisfactory for use in both processes. The present

good zinc base alloys, he said, have the stability of pure zinc. The smallest growth that can be expected in a zinc base alloy, he asserted, would be no more than in iron.

R. M. Curts, New Jersey Zinc Co., said that research had accelerated improvement in zinc base alloys. One alloy, after three or four years' normal aging, has shown no growth. These alloys now have sufficient permanency for most uses, he added. Replying to an inquiry as to whether it is most desirable to use virgin metal for castings, Mr. Stern said that remelted material is applicable to most jobs if the iron content is held down.

Refractories for Non-Ferrous Furnaces

TWO papers prepared under the sponsorship of the non-ferrous survey subcommittee of the joint committee on foundry refractories were presented by H. E. White, Lava Crucible Co., Pittsburgh. One discussed the care and maintenance of fuel-fired furnace linings in the non-ferrous foundry. Data secured in surveys were compared. These show a decrease in the use of fire clay refractories and an increase in silicon-carbide, alumina-silica, mullite and aluminum oxide types.

The author analyzed the causes of failure, which are numerous, spalling and improper furnace atmospheres being two of the most important. Types of available lining materials were listed and discussed. Proper installation was stressed, drying and glazing being of special importance. Factors conducive to long life were listed as proper installation, thorough preheating, proper glazing before using, daily inspection, hot patching when needed, weekly cold patching and the use of mild cleaner to remove accumulated slag.

Mr. White, in his second paper, discussed refractory maintenance cements in the non-ferrous foundry. The desired properties of these cements were said to be elasticity, mechanical strength, high softening point, resistance to abrasion, low shrinkage, resistance to disintegration, slagging and spalling, long vitrification range and workability. Specifications, if furnished, would be of considerable assistance in securing proper material, and data for such specifications were given. Numerous brands of cements were studied in the preparation of this report and these were discussed under various groups.

Discussion

Mr. White, in the discussion, said that he hoped that manufacturers would list properties of cement and that users would become accustomed to these properties so that they would know what they would need and where to get it. H. M. St. John commented that the subcommittee, of which he is the chairman, had found wide differences in experiences in many foundries. Some were getting phenomenal life from their furnace linings. Often linings are used too long or beyond the point of economy because of the patching costs.

It was also pointed out that cheap linings and patchings may be more expensive in the long run. An opinion was expressed that the papers would stimulate research of refractory linings and patches and lead to selection of proper refractories.

Turbine Blades and Gas Engine Valves

NOTES on steels and high alloys used for severe service were presented by John L. Cox, assistant to president, Midvale Co., Nicetown, Philadelphia, in a discussion of Charles McKnight's paper on "Nickel Irons and Steels," given before the May meeting of the American Iron and Steel Institute. He said that nearly all metals for high temperature work contain nickel and chromium (sometimes one is dominant, sometimes the other), generally combined with other elements like silicon, tungsten and titanium.

"It was once thought that steel of the well-known 18 per cent chromium, 8 per cent nickel type (Krupp's V_2A) would do well for turbine blading, but this has proved disappointing, and it is in very limited use for the purpose, if at all. With higher chromium and fortified by high silicon and vanadium, it is used by one American builder, but in the United States blading is usually of 5 per cent nickel steel or of stainless iron (carbon less than 0.12, chromium about 12 per cent). Sometimes manganese-copper and sometimes monel metal is used, especially for stationary blades.

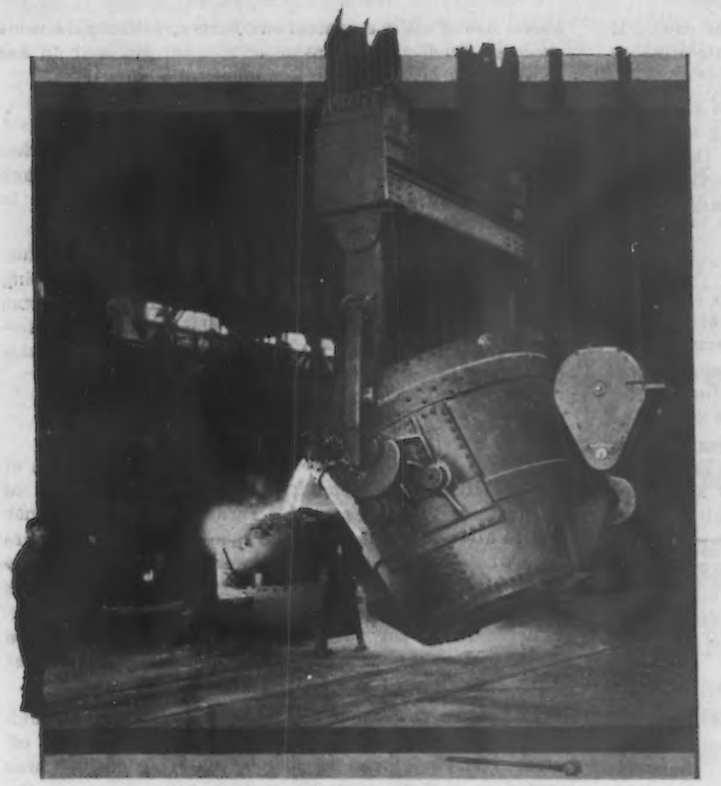
Types of Alloys Used Abroad

"Abroad a special nickel-chrome alloy of about 36 per cent nickel, 11 per cent chromium, known as ATV-1, patented by M. Girin of the Commentry-Fourchambault et Decazeville company, has been rapidly growing in favor in spite of its cost, being wholly free from corrosion even in salty superheated steam, and singularly free from erosion. Being austenitic, it has better high temperature characteristics than most pearlitic steels, and it does not require polishing for permanency of surface, as does stainless iron. Finally, such blading is not embrittled by being end-fixed in molten cast iron.

"For gas turbine rotors running at high temperatures and very high speeds (up to 50,000 r.p.m.), Hadfield has devised a 26 per cent nickel, 14 per cent chromium, 3 per cent tungsten steel known as Era/ATV, or ATV-3, which has higher physical properties when hot than ATV-1, and is somewhat harder to work. This grade has also been used with great success as exhaust valves for internal combustion engines—many of the fastest foreign racing cars and airplanes have used it.

"I doubt if any internal combustion valves of 18 and 8 are in service, as this material develops intercrystalline weakness at temperatures exceeding 950 deg. Fahr., if of usual carbon content, and exceeding 1300 deg. Fahr., if carbon be below 0.07 per cent, and it is not suited to withstand shocks when hot.

"Probably most American automobile engine exhaust valves are made of a steel containing chromium about 9 per cent, silicon 3.5 per cent—but nickel is a constituent of many, the content generally ranging from 1.5 to 8 per cent, though sometimes rising to 19 per cent or more, with chromium and low percentages of silicon, aluminum, tungsten, titanium or cobalt."



Open-Hearth Operators Discuss Their Steel-Making Problems

OPENING the eleventh semi-annual meeting of the Open-Hearth Committee of the American Institute of Mining and Metallurgical Engineers in the Hotel Statler, Buffalo, Leo F. Reinartz, chairman, announced a change in the general program under which the meetings are carried on. Heretofore topics have been brought up, and thoroughly discussed, in such profuse number that pretty much the whole ground has been covered. There has necessarily been considerable repetition. To avoid this in future, it has been decided to make use of the standing committees in getting down to specific problems.

At the same time, a committee was appointed to draft a constitution, which will take the place of the loose form of organization existing up to now. J. M. Hughes is chairman of the committee, with Dr. C. H. Herty, Jr., G. D. Tranter, M. A. Smith and E. L. Ramsey as the other members.

A registration fee of $5 for each individual attending is being imposed for the first time. This was found necessary as a means of carrying on the financial end of the work. Total registration was 123, and the number of operating men was much the largest yet reached. Fifty companies were represented. It was announced that the Jones & Laughlin Steel Corporation and the Bethlehem Steel Corporation have become members since the last meeting.

Furnace Construction

INCREASING the capacity of plants through either enlarging existing furnaces or building new ones was discussed by the chairman of the Furnace Construction Committee. If it becomes necessary in enlarging a furnace to enlarge also the flues and the regenerators, the cost of the change may be considerable. Even so, however, much financial advantage has been found from making such an enlargement. Cases were cited in which the smelting capacity was increased 15 per cent hourly, with a reduction in the unit fuel expenditure of about 10 per cent on a ton of ingots.

In connection with changes of this character, where a regenerator chamber is fixed in size, it is found possible to obtain brick of new designs which will absorb core heat to the cubic foot of chamber. Also the preheating of air will help. New valves frequently are needed and, when properly designed, give much benefit.

Gas producer capacity may be increased by installing more powerful blowers, or it may be found advantageous to substitute oil for producer gas as the fuel, thus making the gas regenerator chambers available to increase the chamber volume for the air.

Longer and Wider Furnaces

It was recommended that an increase in the size of an existing furnace should so far as possible take the form of lengthening or widening the path, or both, as little advantage was believed to exist in making it deeper. In some cases, it is possible to gain 18 in. in length at each end of the furnace, and a few inches in the width. In the latter, the maximum usable width was stated to be about 16 ft. Heavy roof brick were said to be advantageous for wide furnaces—18-in. brick, with 22-in. ribs, being suggested.

Insulation of the lower parts of a furnace to avoid infiltration of air was recommended. Steel plates encasing the lower side walls, and the walls and roofs of the regenerators, were recommended. Larger slag pockets will probably be necessary.

Strengthening Ladle Runways

On the pit side, larger ladle cranes will be necessary, in which case the present runways and columns may be a determining factor. If this is the case, it is easy to rivet cover plates on the columns and to strengthen the bridges of the cranes to take the heavier load. By using an oval-shaped ladle, instead of one with circular horizontal cross-

section, the same bail arms on the crane may be used. If the depth of ladle is not increased, the ferrostatic pressure will remain as before.

Another point of change lies in the method of charging, which may have some importance. It may be necessary to change the character of scrap used, if the operation is to be carried forward without hitch. Soaking pits may need greater capacity, as there will be a larger number of ingots to the heat.

Some of the Operating Results

Discussing this question of larger furnaces, one plant which has made numerous changes of this character reported getting about 17 tons of ingots to the hour of operation from each of the largest furnaces, in comparison with only 12 tons on the smaller units, these being figured from charging to tapping. The length of heat with 250-ton charges was 15 to 17 hr., while 10 to 12 hr. sufficed for 150 tons. Unit fuel consumption of 400 to 500 lb. of coal was reported. The largest heat made in this shop was given as 393 tons, tapped into two ladles.

Another plant which has enlarged some furnaces from 92 tons to 250 tons expects to get an advantage of the order of 4 tons to the hour, when using hot metal, and about 3 tons with cold metal. This comparison is between the 250-ton unit and one of 140 tons in the same shop.

Using Natural Gas in Furnaces

CONTROL of natural-gas burning was reported to be dependent in large measure upon the position and character of the knuckle at the ingoing end. The port opening in one furnace of 100-ton capacity was stated to be 10 or 11 ft. wide, with a height of 19 to 21 in. at each end of the opening, and perhaps 3 ft. at the center of the arch.

Gas comes in from the sides just in front of the bridge-wall, while air comes up, passing over the bridge-wall and above the gas ports. Thus it forms the mix through its greater density, and at the same time directs the flame downward upon the bath. Results from this furnace, using cold metal charges, were reported to be about 6500 cu. ft. of gas to the ton of ingots, or about 6,500,000 B.t.u.

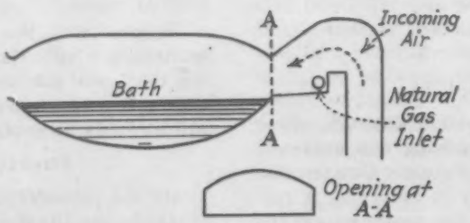
Smaller fuel consumption was reported in a much smaller furnace, which is said to use only 5000 to 5400 cu. ft. of gas, and to make a 30-ton heat in 5 hr. 40 min., tap to tap. In this case, about 88 per cent of the gas comes through the side burners and the remaining 12 per cent through an end burner, consisting of a pipe carried down through a center division wall between the two gas ports.

Making the Roof Last Longer

Use of this end burner in this installation was found necessary in saving the life of the roof and in directing the gas down upon the bath. The burner is about 3 ft. farther from the bath than the knuckle. It operates at a 16-lb. pressure, compared with only 6 oz. on the side burners, the latter being governed by a regulator.

Another furnace of 40 tons, insulated with Sil-o-cel, was reported operating with 4200 cu. ft. of gas to the ton of ingots. The side burners are on 8-oz. pressure, and the furnace is carefully watched and kept in balance, blowing out a little at the doors.

In another case a furnace having a straight roof, and using gas at the sides as before, makes use of oil in a central end burner, with considerable success. Such a combination of natural gas and oil has proved very acceptable in a number of plants.



LONGITUDINAL Section (Not to Scale) Showing How Natural Gas, with Air for Combustion, Is Fed in to an Open-Hearth Furnace

Water Cooling Systems

Most of the reports upon water cooling indicated that the general practice is to introduce the water through the cellar and pipe it up to the individual furnaces. In most cases it is then wasted to the sewer.

One report from a plant having a large number of furnaces was that provision is made for possible pumping difficulties. Water is brought in at several points from two or more pumping stations, and the piping is so interconnected that, if pumps clog with ice or any other trouble arises, the furnaces will still have water.

Use of Refractories

USE of Loftus brick was reported by the chairman of the Refractory Committee to have given a total of 336 heats of the first run of a furnace, which had minor repairs after 180 heats. At the time of the minor repairs there was a deposit of about 3 in. of soot on the top row of the air checkers, and perhaps ½ in. about six courses down. At the conclusion of the entire run the gas checkers were found burnt down pretty badly, resulting in a recovery of only about 50 per cent of their brick, against 90 per cent from the air checkers.

Keeping a furnace hot to burn in a bottom, through melting the finely crushed slag, and then cooling it off before charging, was recommended. The cooling was wanted so that the bottom would not be plastic at the time the heavy material was put in.

It was stated that, if silica in the bottom gets above 5 per cent, there is likely to be trouble from bottom holes. Hence, an analysis is made of the slag being used, and it is mixed with magnesite in the proportion of 1 to 5 or so, according to the silica found in it. This may run as high as 16 per cent. At the end of bottom making, the proportion might be as great as ten of magnesite to one of slag.

American Magnesite Satisfactory

As has been reported repeatedly before, American magnesite is found by many operators to give as good results as the imported material. No particular preference was expressed as between the product from Washington and that from California. In some plants Canadian magnesite is used, and in others, Austrian.

Loftus bricks in one plant were reported to have given a run of 381 heats, with a recovery of about 70 per cent of the brick. This resulted in better tonnage from the furnace and gave better preheat to the air. One man reported that a Neilson survey on Loftus brick gave a reclaim of only 25 per cent after 250 heats. This, however, was bettered by the experience of many present at the meeting.

Theory of Bottom Making

REFRACTORIES in service should be more or less plastic, instead of rigid, in the opinion of Prof. William J. McCaughey of Ohio State University, Columbus. Rigidity is needed, however, in the ports, which are made of silica brick. Roof brick are nearly a standard product, but we are now examining the changes taking place in them.

We do not like to use 20 per

cent of slag in the magnesite mixture for the bottom. It is used, however, because it is needed to make a bond, on account of the slow coalescence of the magnesite. Dolomite has quick coalescence, but it lacks the degree of permanence possessed by magnesite. We are now trying to develop a quick coalescing or quick setting magnesite, he said. In this we are heading for a new synthetic refractory.

We are getting a high concentration of magnesium oxide—as much as 92 per cent—and want to avoid the use of slag if possible. There is very little penetration of furnace slag into a bottom, beyond about 1 in. below the surface of the bottom. Even with the weight of 100-ton heats, it is mostly squeezed out of the bottom and kept where it belongs.

OPERATING men who talk shop at breakfast, lunch and dinner, discuss their problems both in meetings and outside, and then sleep over some knotty matter in preparation for threshing it out next day, are the ones whose views are set forth in this article and the one which will appear next week. As one man put it, on the train coming home: "I'm so tired of talking about open-hearth furnaces that I'm glad to go where all I shall have to do is to run them."

Shop Organization

REPORT of the Organization Committee was based largely on consideration of working the men six days a week instead of seven. Changing of shifts was reported to be customarily as follows: Men leaving the works Saturday, midnight, return at 8 a.m. on Monday. Those working shifts from Saturday midnight until 8 a.m. Sunday return at 4 p.m. on Monday, and work until midnight. Those working from 8 a.m. until 4 p.m. Sunday come back after only an 8-hr. rest period, reporting at midnight Sunday night.

Considerable difference of opinion or variation of practice was reported by some of the operators. A number of plants are working seven days, straight through, with no layoff on Sunday. In these cases, however, there is not a full crew of the 10-hr. men on Sunday. Other plants, however, have no Sunday work except on the part of the maintenance men.

Only Six Days at Many Plants

There is a growing tendency in these plants operating seven days not to permit any man to work more than six days. These plants have a "floating" man for every six regular men. This is not universal, but it is coming more and more into use.

When radical changes are made in open-hearth construction, how are the rates of operators adjusted? One plant reported no change, except that a tentative increase of 8 per cent for first and second helpers has been made, which is subject to later revision. In another case a sliding scale is established, year by year, taking care of these furnace alterations as they come along.

Labor Charges on Repairs

Paying labor on furnace repairs was reported upon by several plants. One adds 10c. an hour to the regular operating rate; another has a definite turn rate for the first, second and third helpers; still others pay straight labor rates for this work. In one case, where the labor rate is 34c. an hour, a payment of 40c. is made for all hot work.

Standards set up in one plant, and based upon careful studies of the situation, make allowances for hot weather, burnt checker brick and many other items entering into the matter. The average rate works out about 5c. above the regular labor rate.

A meeting is held for each repair job, to decide which of the various rates will apply on that particular job. This meeting includes all the superintendents and foremen involved. It is believed that a faster job is obtained by thus setting the hours as standard for each job—a period for tearing down the furnace to the slag line, another for taking down the port ends, etc.

Instruments in Furnace Work

Use of control instruments was reported to have reduced the oil consumption in one furnace from 42 gal. to the ton of ingots to 32 gal. Much less oil is wasted, and there is at the same time better combustion and a larger tonnage output. One man reported that his shop has a competition among the men, to see who can get the best oil consumption results.

Instruments on furnaces using mixed gases are reported to have given a saving of about 6 gal. to the ton of steel. In one case this figure on a month's run was brought down to 29 gal. In this plant, men running oil-fired furnaces are trying to beat the combustion records made by the mixed-gas furnace.

Pouring Practice

REPORT of the Committee on Pouring Practice discussed briefly ladle dimensions and shape, stopper heads and sleeves, the need for positive control on the stopper lifting device and the taper, thickness and corner radius of ingot molds.

One operator having both 115-ton and 250-ton furnaces reported using 2-in. nozzles for most of his steel, and 2¼-in. for the rest. He pours into a mold 22 x 25 in. at the bottom and 21 x 24 in. at the top. He wants to find a little skull left in the ladle, but takes no chance on freezing the steel. Before pouring into the molds, he sees that they are warm or even hot. He finds that round ingots rim better than rectangular ingots, but the latter can be rolled faster.

Bottom Casting of Ingots

A plant making bottom-cast ingots through a 2½-in. nozzle adds in the ladle from 2 to 9 oz. of aluminum to the ton of steel, the smaller quantity on high-carbon and the larger on low-carbon steel. He pours about 15 ingots to the set, the molds being 19 x 22 in. bottom and 17 x 20 in. top, and with thickness 5¼ in. at bottom and 4 in. at top. Two such groups of molds are poured from one ladle. He reported that the steel should be under 0.1 per cent silicon for best effect in rimming.

Another bottom-pour plant makes use of 87 different sizes of molds, all about 90 in. high. These vary from 7 x 14 in. to 40 x 90 in. With a 100-ton heat, the steel is poured through a 1¾-in. nozzle, while a 1½-in. nozzle is used on 50 and 70-ton heats. If the nozzle is opened fast, there will be bad splashing. Slow pouring gives best results on the ingot skin. This plant has not had much success in bottom pouring of killed steel.

Another plant, however, practices bottom pouring for 15 to 20 per cent of its killed steel. This all goes into round molds, with diameters 11½ to 18 in. Lapping is avoided by governing the speed of pouring and by the use

of a mold wash. One operator reported that the thickest skin is obtained with slow pouring. He pours eight 5800-lb. ingots through a single nozzle, and believes that a similar number of 5-ton ingots could be poured by using a larger nozzle and larger runner brick.

Temperature and Rate of Pouring

For hot-top ingots poured from the top, the temperature of the steel and the rate of pouring are most important, in the opinion of one speaker. The bath must be hot, making it more fluid, and better ridding it of inclusions. He recommended melting the heat hot and then pouring from the ladle as cold as practicable.

With 100-ton heats, he advocated pouring so as to give a skull weighing 1000 lb., and said that this can be done without nozzle trouble by using a nozzle 1¾ in. or larger. He stated that a heat, regardless of its size, must be poured in between 30 and 60 min. There is a temperature differential of 3 to 4 deg. between ingots; this results with 40 ingots in dropping the temperature from about 2850 deg. to 2700 deg. No difference in chipping costs is observed from the successive ingots of such a heat.

This speaker advocated the use of a stool with a dish in it, and opening up the nozzle slowly. It should be opened to its fullest extent, however, before the steel gets out of the rounded part.

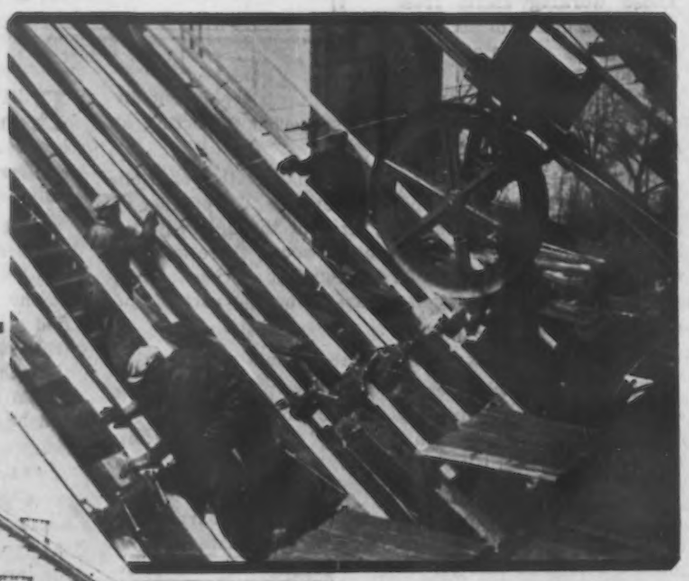
Tapping a 75 or 100-ton heat should occupy from 5 to 7 min., according to one man. A Canadian operator reported, however, that he takes about 14 min. in tapping a 130-ton heat, including running of the slag, getting about 9 gross tons a minute, through a 6-in. hole. He reports no stopper trouble from this practice. Another operator reported taking as much as 20 min. to tap an unusually large furnace, and about 10 min. on furnaces of half that size.

Officers Re-Elected

BOTH Leo F. Reinartz, chairman of the conference, and William D. Buck, secretary, were unanimously re-elected to these positions. The nominating committee, after canvassing a large number of the operating men, expressed the utmost confidence and gratification at the way in which the affairs of the committee have been handled during the past few years. Mr. Reinartz is assistant general superintendent, American Rolling Mill Co., Middletown, Ohio, and Mr. Buck is metallurgist, Granite City Steel Co., Granite City, Ill.

(To be concluded)

The New Hudson River Bridge from Upper Manhattan to New Jersey



AT the Left May Be Seen How the Wires Are Brought Down to the Anchorage (New York Side). The close-up gives some insight into the operations of clamping the wires into cables as each cable is built up from the stranding wheel which carries from anchorage to anchorage over the tops of the bridge towers a pair of wires each time it travels

Management in Foundry Operation

Personnel Direction, Sales Analysis and Market Research, and the Advantages of Order and Neatness

THREE topics were taken up under the general heading of management, at the Cleveland convention of the American Foundrymen's Association. "Personnel Management" was discussed by Dr. Harry Meyer, Frigidaire Corporation, Dayton, Ohio. "Value of Sales Analysis and Market Research" formed the subject of an address by J. P. Newman, McGraw-Hill Publishing Co., New York. "Neatness and Cleanliness as an Aid to Foundry Operations" was the title of a paper by Edward Trapken, Sandusky, Ohio. These are abstracted below.

THAT labor is not a mere commodity was stressed by a speaker at the Foundry Convention. He told much about looking after the interests of the man on the job and defined the prime task of industry as "to serve people." Personnel, both inside the plant and out, deserves, he believes, first consideration.

Personnel Management

BRINGING out forcibly the radical change of view which has taken place during the past few years in connection with the relations of management to the employees, Dr. Meyer emphasized his strong opinion that as radical changes will take place in the future, and that it is to everyone's interest to see that these are brought about.

He started with the old slogan, *Caveat Emptor*, so long prevalent in purchasing, but which has now been largely superseded by the fact that reliance may be placed upon the product of reputable companies, which will make good on defects. Even now, however, the interest in the buyer, on the part of the company, begins only after the purchase is made. Why should it not begin before? Everything, in the last analysis, ties back to the individual.

Old Ideas No Longer Prevail

Personnel management began about the time of the World War. Men were scarce. They were restless. The object was to keep them contented in a given employment, and thus to keep them from leaving that employment. So long as there were fewer men than there were jobs seeking them, this took the form largely of entertainment in the way of athletics, picnics, etc. It went largely, also, into group insurance and other items calculated to hold the men's interest.

Early personnel departments were not built well into the organizations. They constituted an outside function, and operated largely without relation to the foreman and his contact with the men. Because of the fact that they were virtually a separate proposition, many of them were lopped off when men became more abundant.

Dr. Meyer defined the personnel job as one designed to make more successful people. This is in contrast with the manufacturing job, which is to make successful products. These truths are not universally recognized. He quoted Mr. Kettering as saying: "The greatest endurance contest in the world is getting a new idea into any factory."

What Industry Has to Do

Industry's prime task is to serve people. Secondarily, industry has to make money. If the first purpose is served successfully, the second measures the extent of that success, and thereby shows that the methods are right.

Work is a prime necessity in all industry. It may be described as the use of time, energy and materials. Good work is the right use of these three items. Poor work is the wrong use, and waste is the misuse. The ultimate goal is to make the best possible product with the least possible cost or use of time, energy and materials.

With regard to the education of the man for the work he is to do, Dr. Meyer has some very strong ideas. "Show the man that, if he will manage in his home as the company must manage in its work, he will make money in his home."

What the Employee Must Do

Six laws underlie all work, and each of them is a cardinal principle precedent to employment in the Frigidaire organization:

1. Be clean and orderly.
2. Take good care of property, equipment and materials.
3. Follow instructions to the letter.
4. Work well from whistle to whistle.
5. Work every day, and let the foreman know if anything prevents.
6. Work well with others.

Similarly, there are six qualifications for the foreman's job. He must keep the shop in a clean and orderly condition. He must have proper equipment with which to do the work. He must provide proper materials out of which to make the product. He must give adequate instructions for carrying on the work. He must give sufficient supervision so that things will not go wrong, and he must provide proper pay to keep the men contented. All of these tie in directly with the six qualifications of the worker, down to the last item, that of pay. If all the rest work out correctly, the pay is bound to do so.

One of the worst things in industry, according to Dr. Meyer, is the customary method of employing men. A little czar sits in the employment office and virtually dis-

penses bread and butter to those seeking work. This is wholly against all ideas of justice, as every man entitled to work should have his chance.

Neatness and Cleanliness as an Aid to Foundry Operations

A NEAT, clean plant is an asset of real value. An orderly foundry is directly reflected in less delays, less unnecessary labor and general employee efficiency. Indirectly, orderliness and cleanliness minimize accidents and lost time through illness of workers.

Also, the psychological effect of clean, attractive surroundings is important, as employees whose morale is excellent are more content with their jobs, more active in mind and body and more efficient in their work. This paper lists several reasons why a clean, orderly foundry holds customers.

Sales and Market Analysis

STARTING with the premise that the major principles of marketing and selling are just as applicable to foundries as to any other type of business, J. P. Newman, McGraw-Hill Publishing Co., New York, gave an interesting talk upon sales analysis and market research. One of the main objects in any such work is to decrease waste in distribution. Sales data must be included in the budgetary control now so prevalent throughout industry.

The foundry industry has been rather production-minded, and very little sales-minded. "Production is the servant of marketing, and tonnage at a profit is the product of marketing," according to the speaker.

Foundry Must Provide Service

He expressed the belief that the foundry industry knows more about its product than does its customer. For this reason it should add an adequate engineering service to its production line, instead of merely making castings from the blueprints of its customers. No longer can it be a case of merely making a sale on the lowest possible price.

A merchandising sense will lift a foundry out of the class of being a local business. With such a sense it will be making a product to meet a well defined need, and it will have all requirements for meeting competition from without.

What the Survey Will Indicate

Study of the geographical extent of the possible market was urged, together with the details of the buying elements within the area to be served. Along with this should go a study of what portion of the products have constituted a profitable business. These items would necessarily be the ones upon which stress would be laid. Study of the outlets, in detail, is essential to this work.

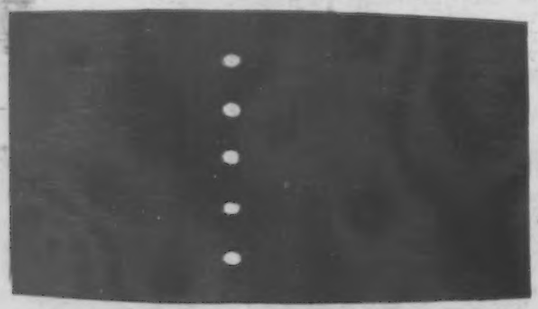
As a sample of this sort of study, the speaker cited a concern which had been making bearings for motor trucks. It saw in prospect the possibility of a good business in making bearings for cars in coal mines. The cars were studied in much detail, with the result that, when the bearings were developed for this purpose, a good market was ready and waiting for them.

In conclusion, the speaker listed eight items of careful study, which any foundry must undertake if it is to make a good merchandising success.

1. Determine the market for the product.
2. Study the types of buyers who will be prospects.
3. Develop a prospect list.
4. Determine the character of the sales organization.
5. Determine the coverage of outside territories.
6. Determine the character of the men who shall cover the field—whether they are to be engineers, foundrymen, or men versed in the industry to be served.
7. Consider the advertising conditions, including direct mail.
8. Make the buyer interest the keynote to the whole program, whereby the salesmen will know what there is about the product that would particularly suit it to the buyer's business.

Tests Electric Welds of ½-in. Steel Plates

HIGH strength and good ductility are possessed by the joints in ½-in. structural steel plates, when made by the electronic tornado process of carbon arc welding, according to tests made by Lincoln Electric Co., Cleveland.



Round Holes Through Weld Stretched to Oval Before Test Piece Failed in Original Bar.

To make the joint a ⅛ x 1-in. strip of the same material as the two plates is placed sidewise between their butted edges, and the arc passed along one surface and then the other at the rate of 12 in. a minute, melting the protruding strip into a rippled welt and penetrating well beyond the center of the joint. About 400 ampere of current was consumed at a potential of 35 volts.

Strength of Original Plate as Compared with Welded Samples

The original plate had an average ultimate strength of 55,000 lb. per sq. in., and a minimum specified elongation of 22 per cent in 2 in. Samples cut from long welded seams in such a way that the reduced section of the test piece consisted almost exclusively of weld metal showed an average ultimate strength of 78,300 lb. per sq. in., yield point of 58,300 lb. per sq in., and elongation in 2 in. of 21 per cent. Test pieces cut transverse to the joint, smoothed flush with the plate on both sides and with 5 holes 0.119 in. diameter drilled through the center of the weld, broke in the original plate.

Ductility at the joint is indicated by the fact that under an apparent load of about 74,000 lb. per sq. in., in metal at the reduced section, it stretched so that the round holes became distinctly oval. According to the Lincoln company, this superior ductility is "due principally to the elimination of the oxidation of the weld metal to the large degree possible in this process by means of the protected arc."

Conveyors Serve Trimming Presses

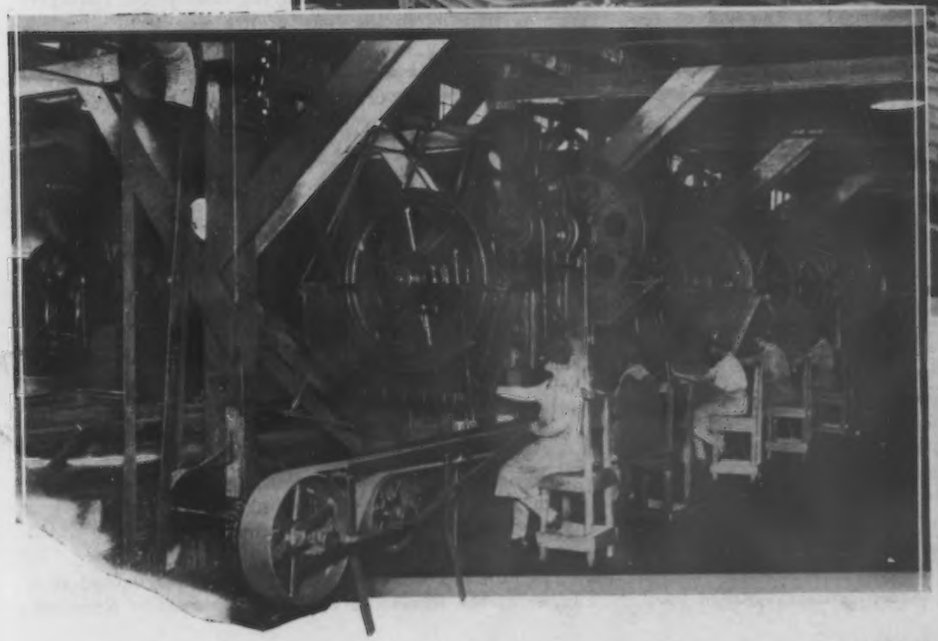
Deliver Forgings to Operators and Remove Scrap and Trimmed Pieces—Used Also for Final Sorting

WHILE conveying equipment is used in a number of drop forge shops, for handling forgings and scrap after cold trimming, the Cleveland Hardware Co. has gone a step further in the use of belt conveyors in the cold trimming department of its No. 2 plant. Here forgings are delivered directly to the trimming presses on a conveyor belt which passes along the front of a line of 20 or more presses, between the operator and the machine.

Forgings for various parts are placed on the feed belt unassorted, as they come from the hammers. As they move along the conveyor each press operator picks off from the conveyor in front of him the kind of pieces he is trimming. There may be 15 to 20 kinds of forgings being delivered on the feed belt at one time. The number on the belt grows fewer as the various pieces are removed by the trimmers and, when the belt reaches the end of the line, a distance of about 150 ft., all the forgings have been taken off.

In case the flow of one kind of forgings is faster than the press operator can trim them, he sets the surplus pieces in a tote box located at the side of a conveyor.

SORTING Belt on Opposite Side of Same Line of Presses. Inclined conveyors on each side of the press, one for scrap and one for trimmed pieces, discharge forgings and flashings on conveyor belt. The conveyor at extreme right brings flashings from the two other lines of presses, which trim the heavier work. Trimmed forgings from all three lines of machines go on to the same sorting belt



SMALL Forgings Are Delivered to the Trimming Presses on a Conveyor Belt Which Runs Along the Front of the Machines, Between Presses and Operators

This provides a reserve stock of pieces to be trimmed when the flow of that particular piece along the belt is reduced, or perhaps temporarily stopped.

Both Flights of Belt Employed

Another feature of the conveying system is that one endless belt conveyor does double duty, scrap being carried in one direction on the upper belt and trimmed forgings in the other direction on the bottom section of the belt. Work is kept moving on the belts instead of being piled on the floor.

Handling of scrap by hand is entirely eliminated. The flashings pass from the presses over a series of conveyors, the last of which discharges them into railroad cars. Trucking has to a large extent been eliminated and it is stated that a saving of 30 laborers has been effected by the use of the conveying system.

The plant makes a miscellaneous line of forgings, largely for automotive parts, ranging from a few ounces up to 4 lb. in weight. A large part of the output is on a mass-production basis. As a drop forge shop is located on each side of the trimming department, work comes to the trimming room from both directions, in skids holding 2½ to 3 tons, carried on an electric monorail running at right angles to the press lines and passing the feed end of the lines of presses.

The work is rather roughly divided into two classes, heavy and light forgings. Two lines of trimming presses are used for the larger pieces and the third line for trimming the smaller sections. The two lines of presses used for trimming the larger pieces are placed back to back and the forgings and scrap from both lines fall by gravity into the same conveyor, located between the rows of presses.

Loaded skids for these two lines, on leaving the monorail, are handled with an electric lift platform truck, which sets them at the sides of the presses, the operator taking the pieces from the skid as he feeds his machine. The forgings after trimming fall by gravity down a chute to the lower part of the conveyor belt, just above the floor. The operator throws the flashings into a chute at the side of the press. Here they drop on to the upper section of the belt conveyor, which carries them toward the feed end of the line, or in a direction opposite that of the work after trimming.

Sorting Belt Feeds into Containers

Trimmed forgings are discharged at the end of the line on to a transverse conveyor which runs at right angles beneath the floor, leaving a clear space in the aisle between the first two lines and the third line of presses. After moving a few feet on this cross conveyor, forgings pass on to an elevating conveyor section built at an angle of about 45 deg., which delivers them to a sorting belt back of the third line of presses. This belt serves as a sorting belt for the forgings from all three lines of machines.

Lighter forgings, delivered on a conveyor belt in front of the third line of presses after forging, drop through a chute on to a cleat type elevating conveyor set at an incline at the side of each press. This conveyor belt delivers the pieces to the sorting belt mentioned above. The operator throws the flashings on to a similar power-driven conveyor at the other side of the press, which discharges the scrap on to the same sorting belt.

As forgings from the three lines move along the sorting belt they are picked off, being sorted by placing the various types in separate containers located alongside the belt. In these containers they are carried by lift platform trucks to cars. A forging, moving on the sorting belt, which passes by the point where it should be removed, is carried along to the end of the sorting belt. Here it is put on the return belt beneath, and is carried back to the end of the line and there again placed on the sorting belt.

Additional Operations Cared For, Also

Many of the forgings require other operations, such as punching or broaching, in addition to trimming. In that case they make two or more circuits of the feeding and sorting belt, being removed from the latter at a point near the end of the line and thrown on a cross-conveyor belt that discharges them back on to the feeding belt.

Some of the presses are grouped for the successive operations of trimming, punching and coining. Chutes are provided between these, and a piece passes by gravity from one machine to the other. After the last operation it goes to the sorting belt. Scrap stays on the belt until it reaches the end of the line.

The conveyor belts slide on a flat steel plate runway, two sides of which project about an inch above the belt, so that the pieces will not slide off the sides of the belt. The belts operating with the lines of presses that trim the larger forgings, and the single sorting belt, are 18 in. wide. The feeding belt for the other line of machines is 8 in. wide. The belts move at a speed of 55 to 60 ft. a minute. The conveying equipment, both the longitudinal belts and the short transverse conveyors, are driven from the same overhead line shaft driving the presses.

Flashings are discharged at the ends of the conveyors running parallel to the lines of presses, on to elevating conveyors which deliver them to an overhead conveyor. This discharges them into a chute and on to an inclined conveyor located along a railroad siding. The latter conveyor discharges the scrap into cars.

Hardening with Nitrogen Studied by Bureau

AT the Bureau of Standards a study of the alloys of iron with nitrogen has been made, which helps to explain the new process of nitriding steel. The usual methods of studying the different alloys formed between two elements were used. The structure of an alloy transforms upon heating, as for instance when an alloy begins to melt, so that a method called thermal analysis is used, in which the alloy is heated or cooled and the temperature at which the transformations occur is noted. Another very important method is the microscopic examination of the different kinds of crystals of which the alloy is composed. By means of X-rays the arrangement of the atoms in the crystal can also be determined.

It is not practicable to harden ordinary carbon steel with nitrogen on account of the insufficient hardness and brittleness of the surface layer in nitrided iron, and special alloy steels containing aluminum, and sometimes molybdenum, and chromium are used. However, before a study of the alloys of nitrogen with these complex alloy steels could be undertaken, the simpler case of the alloys of nitrogen with pure iron had to be studied. Pure iron appears to form three definite compounds with nitrogen, containing respectively 4, 6 and 11 per cent nitrogen. The intermediate compound containing 6 per cent nitrogen appears to be the one to which the hardness of nitrided iron is due.

The bureau's work in this field will be described in a number of the Bureau of Standards *Journal of Research*.

Steel for House Construction

Large Potential Market Awaits Adequate Financial Consideration—New Materials Properly Designed

BY LEE H. MILLER

TODAY the largest potential market for the steel industry exists almost untouched in approximately 800,000 residences built each year in the United States. For 20 years men of vision have contemplated this potential harvest and have struggled to garner it. But in their individual effort to reach the residential construction field, they meet range after range of barriers.

Department of Commerce records show that in 1929 the structural steel used in the United States was approximately 3,850,000 tons. But the 800,000 residences offer a possible outlet for more than 5,000,000 tons of steel a year. We should be able to more than double our market.

If house construction is ever to experience a high standard, justifying a more liberal consideration from financiers, it must come through the introduction of new materials properly designed and installed.

Floors as a Basis

Any floor construction that would meet the numerous requirements of occupancy would make the material of which it is constructed easy to promote for such other features as interior framing, partitions and roofs. To attempt to substitute steel for wood by imitating wood methods is both illogical and expensive, and success depends on using it along engineering principles which apply to its physical properties, just as was done on ships, railroad cars and automobiles.

Steel plates 24 in. wide and 3/16 in. or ¼ in. thick can be supported at their edges on parallel beams 3 in., 4 in. or more in depth, and by automatic welders the plates and beams can be united to give a floor of great strength, free from flexibility.

This floor can be fireproofed on the ceiling side to resist the destruction of the (room) contents by fire without losing its strength. It can be given top surface treatment to meet any occupancy requirement, and all for a first cost that justifies its universal use.

It will be free from shrinkage, warping and other annoying features. Covered with cork tile laid in a mosaic pattern, it eliminates the necessity of carpets except as ornaments. And the cost, complete, is less than that of a good domestic carpet required to cover other types of floors.

Light Unit Weight But Great Total

For multiple-story steel frame structures this floor reduces the dead load from 30 to 50 per cent or more, and permits higher structures on the same frame and foundations. Its (small) thickness reduces the height from floor to floor by several inches.

The weight of the steel in such a floor would be from 10 lb. per square foot for light loads and relatively short spans to 15 lb. for heavier loads and longer spans. If the floor area of the average residence is 1500 sq. ft., it would require a minimum of 7½ tons of steel for each residence, or a total of 6,000,000 tons for the 800,000 homes built each year.

Adoption of the steel floor would greatly simplify the rapid introduction of steel for other parts of the frame, roof and partitions, and would open the greatest market the steel industry has ever known. It can be done, and ultimately it will be done. But all the interested parts of the steel industry, acting in cooperation, are essential to its completion.

Discussion

STEEL houses comprise more than steel frame and steel joists, said C. J. Foster of the National Bridge Works, Long Island City, N. Y. To solve the steel house problem a completely engineered, shop fabricated structure, to cost close to $4,500 (the cost of the present aver-

Abstract from paper read before American Iron and Steel Institute, New York, May 9.

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CHIEF engineer of the American Institute of Steel Construction, Lee H. Miller was one of the founders of that organization and has been prominently and actively identified with the structural steel industry in various capacities for more than 25 years. He was born in Aylmer, Ontario, Canada, in 1877 and was educated in the public schools and the Collegiate Institute of that city, subsequently being graduated from the faculty of applied science and engineering of Toronto University in 1900. After graduation he went to Pittsburgh, where he was employed as a structural steel draftsman, and later became associated with the Brown Hoisting Machinery Co., the Wellman-Seaver Engineering Co. and the McMyler Co. He started the work of organizing the American Institute of Steel Construction in 1922.

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age house) must be erected by skilled mechanics. This will involve sectional erection, and include steel stairway, sash, trim, shingles and accessories, with correct provision made for various partition layouts, and for water, sewer, and heating pipes and for electric wires. In Mr. Foster's opinion, such houses can now be manufactured in quantity and to compete with the sub-standard type of construction now prevalent. The result will be a superior house, non-combustible, vermin-proof, and well insulated against temperature and noise.

Such a wide departure from carpentry methods is not desirable at present, in the opinion of R. H. McClintic, vice-president Steel Frame House Co., Pittsburgh. His company manufactures a steel frame that has deliberately used the ordinary spacings for wooden studs and joists. This conforms to the economic requirements of the present situation, rather than to the theoretical advantages of steel, since so many of the accessories now used in houses, such as insulation, lath, siding and mill work, conform to the standard 16-in. spacing. In view of the fact that the frame of a house costs only one-fifth the total, he and his associates feel that it is desirable to meet the requirements of the accessories until the steel-frame idea has received enough promotional work and cooperative publicity by the whole metal industry, so that the other manufacturers will produce accessories that fit into the spacings more suitable for a steel skeleton.

Speaking as an architect who has vigorously opposed the construction of fire-traps now being rented as apartments in the metropolitan district, A. J. Thomas of New York said that the battledeck floor looks like a desirable improvement in multiple family dwellings, even though little steel is used elsewhere in the structure. He has found it very difficult to convince banks and other money lenders that the rentable area of a building is a bad basis upon which to figure valuation for mortgage purposes.

Gradually, however, some important financing companies are beginning to realize that an honestly built, fireproof house in attractive surroundings is a better risk even up to 75 per cent of its first cost, than 50 per cent on a jerry-built structure of greater proportional renting area. To promote these ideas, which will inevitably expand the use of steel in house construction, Mr. Thomas said that there is ample opportunity for cooperation between the architect and the steel industry. The latter could help by devising methods of mass production and labor-saving erection devices that will keep the costs of the material down, by advertising continually the "fireproof floor," and by agitating for the revision of codes and working stresses so that light floors could be installed where light loads only will be borne.

White Rust of Galvanized Wares

THE so-called white rust, often noted on the surface of zinc-coated sheets and wires, has been the subject of investigation by E. H. Schulz, who reports his findings in *Stahl und Eisen* for March 20.

White rust is most frequently observed in cases where the galvanized material is exposed to the action of sea-water. It is noticed also in cases where pieces are packed so closely that, upon wetting by rain or dew, subsequent drying out is retarded. This would apply to piled sheets or wires wound rather closely on spools.

It has been determined that the rusting of zinc coatings in sea-water is a fundamentally different process from that which is occasioned by the action of condensing moisture in confined spaces. The former is due to the particular action of chloride and of small amounts of magnesium.

In the latter case, the reaction is described as follows: Initial formation of zinc hydroxide takes place when water remains in contact with zinc for an appreciable length of time. The solution formed is hygroscopic, so that, once the reaction starts, it proceeds indefinitely by absorption of additional water from the air. Carbon dioxide is also absorbed from the atmosphere and causes the formation of basic zinc carbonate. By analysis of the samples of rust it is found to contain zinc oxide, hydroxide, and carbonate. In appearance and chemical action it is much like iron rust.

It has been noticed that materials shipped from Germany to South America suffer especially from the white rust. In explanation, it is believed that the route followed by steamers between these points is subject to excessive precipitation of moisture. Certain galvanized products from the United States are greased before shipment to South America.

The remedy for white rust is to be sought in proper atmospheric conditions, free access of circulating air being the most important. The purity of the zinc is claimed to have no influence.

Rail Fissures Develop Very Rapidly

HIDDEN defects in rail in track have been sought by a detector car owned by the American Railway Association, and using the electro-magnetic method suggested by Elmer A. Sperry (see THE IRON AGE, Nov. 15, 1928, Sept. 26 and Nov. 21, 1929). Records for its first year of operation on 23 railroads were presented by W. C. Barnes, engineer of tests, rail committee, before the recent meeting of the association.

In the 2908 miles of track tested a total 213 transverse fissures were detected, the smallest being the size of a nickel and many approaching the full area of the head. The rate figures to 1 per 13.6 miles. Total fissures reported to the association by 54 roads operating 149,000 miles averaged one failure in 27.3 miles. The added rate is due to the detection of many fissures of less than breaking size, and to the fact that the car was usually operated on track where a high rate of failure was being experienced.

Mr. Barnes discusses the efficiency of detection. In practice small fissures are not distinguishable from minor surface imperfections. In only one instance was there an additional fissure detected on a re-run, but many failures have occurred in track within a few days after it had been given a clean bill of health by the detector car. Some evidence is noted that the time required to develop small fissures to breaking size is measured in days, instead of years, as was formerly thought.

Several large systems have applied for long leases on the association's car, and Mr. Sperry has organized a service corporation operating other detector cars. These facts indicate that railroad men believe that the use of the device represents a real advance in rail safety.

Builds Notable One-Story Plant

Unusual Provision for Safety, Comfort and Recreation of Employees Made by Western Electric Co. in Baltimore Unit

LAID out for efficient operation and with provision for the convenience, comfort and safety of the employees, and with good transportation facilities by land and water, a great industrial plant is rising on a strip of land known as Point Breeze, on the outskirts of Baltimore. Five or six miles from the heart of the city, the Western Electric Co. selected this site for its works for the manufacture of cable, insulated wire and substation equipment.

Various factors entered into the choosing of this site, including transportation facilities and the proximity of a plentiful supply of labor. Lying between the Pennsylvania Railroad on one side and the deep sea on the other, the transportation facilities are regarded as excellent. The plans contemplate the gradual expansion of manufacturing facilities by the erection of additional buildings and extensions to present buildings from time to time.

When completed, the plant will furnish employment for 30,000 people. Two of the manufacturing buildings, the cable plant and the insulated wire plant, have been completed and the former is now in operation. A new powerhouse and a three-story factory office building adjoining the cable plant have been completed, also. Construction of a large building for a restaurant is now under way.

Site Much Enlarged by Filling

With water on three sides, the Point is somewhat in the shape of a man's thumb. It is formed by the junction of Colgate Creek, a small stream, and Patapsco River, the latter having its outlet into Chesapeake Bay. Sea-

Later Construction Is Shown by Blocked-in Areas and Titles. Off the picture at left is the shipping area, on made land, as shown on next page

going vessels will be loaded and unloaded at a wharf at the lower end, where there is 24 ft. depth of water.

Formerly occupied by an amusement park and shacks, the site originally comprised about 120 acres. This has been increased to 180 acres by the erection of bulkheads around the lower end and parts of the two sides, permitting reclaiming of 60 acres by filling in within the bulkheads. This at the same time provides docking facilities, so that ships and lighters can be loaded at the back door of the plant. The bulkheads are over a mile in length and their erection required nearly 10,000 piles, capped with concrete.

A through road known as Broening Highway divides the site into two sections. The highway extends to the lower part of the site, where it crosses Colgate Creek. All the manufacturing buildings will be located on one side of the road, the building sites being at a uniform distance from the highway. Centrally located, near what will be the axis of the group of buildings, will be a central administration building. The powerhouse adjoins this site.

Employees to Have Eastern Section

On the opposite side of the highway the entire tract will be used for recreational and other facilities for the employees. These will include gymnasium, swimming pool and an athletic field with tennis courts, running track, baseball diamond and football and soccer field, all grouped together in a convenient central location.

On each side of the athletic field, extending the length of the site, will be two large parking lots with room for thousands of cars. Driveways will extend through these lots and each parking space will be numbered, so that an employee will always have the same space for his car. With the two parking areas extending along the highway across from the manufacturing building, no employee will have to walk a great distance from his parking place to the building in which he works.

Ample Provision for Handling Materials

A large freight classification and car storage yard has been provided along the outer (southwest) side of the plant, adjoining the Patapsco River. Loading tracks extend along the side of the cable plant, where there are covered loading docks; another track extends through the plant.

This building has eight aisles, five of which are served by one or more traveling cranes of 15 to 50-ton capacity. These are provided with motor-driven grapples, by the use of which the crane operator can pick up and set down a reel without the assistance of floor-men.

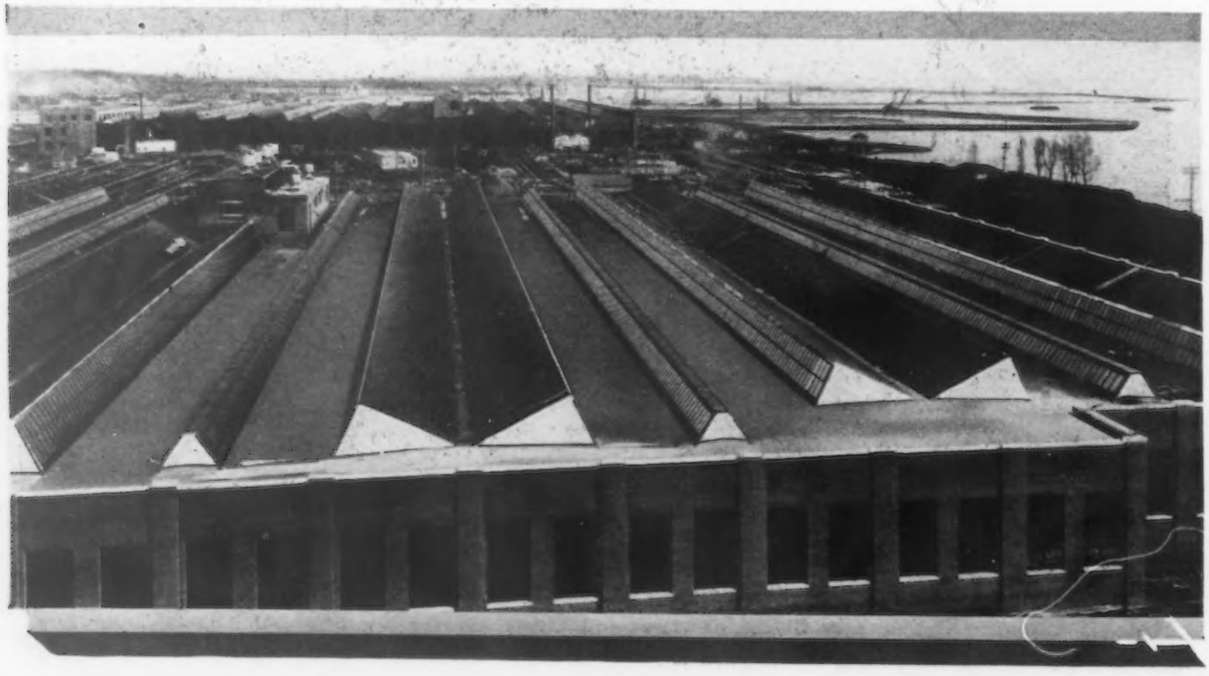
A rod and wire mill is provided for in the plans. The site for this is at the southeast side of the cable plant. The next main building to be constructed will be a plant at the north end of the site, for the manufacture of substation equipment. This will be a six-story reinforced concrete building, approximately 700 x 900 ft., having towers of eight stories at the corners.

At the lower end of the site near the wharf are two storage yards, one for loaded and the other for empty reels. The dock will be equipped with a gantry crane and a stiff-leg derrick for loading reels and other products on to ships and handling incoming cargoes.

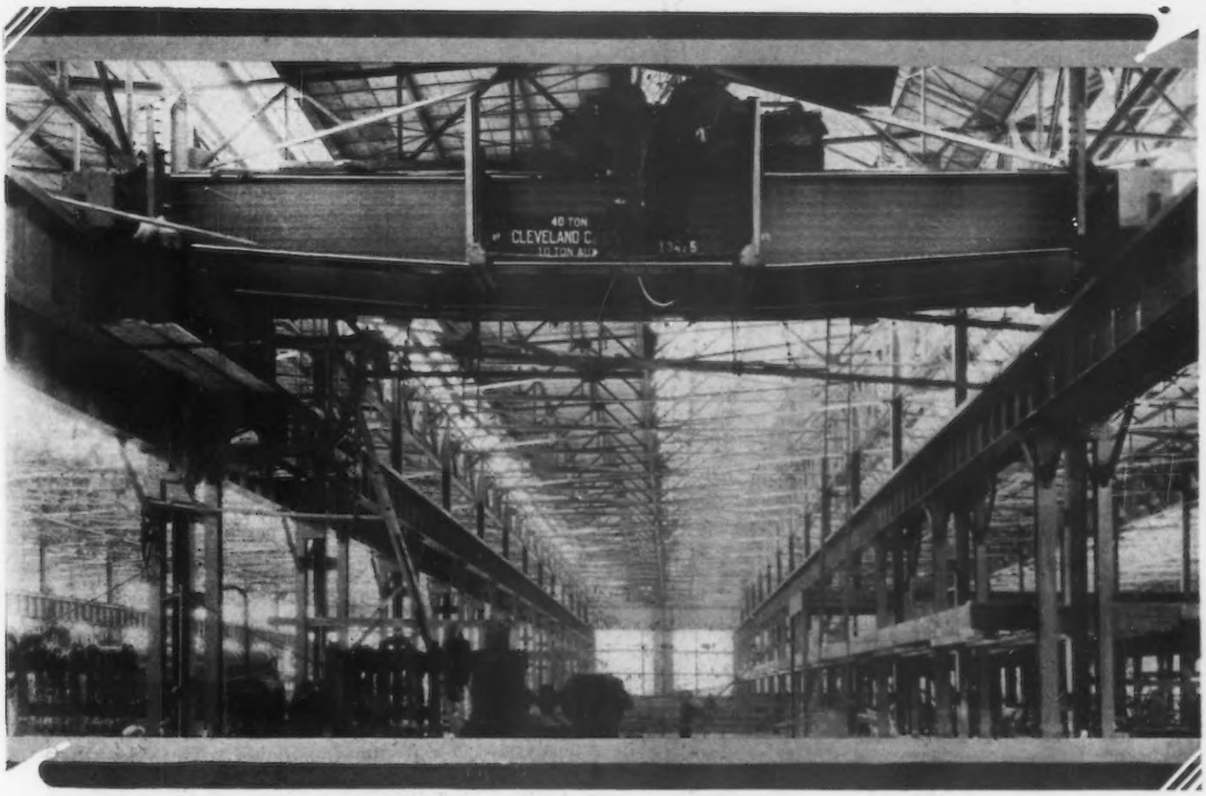
Natural Lighting Received Great Care

The cable plant and the insulated wire plant are single-story structures, the former 500 x 600 ft. and the latter approximately 400 x 600 ft. Artistic in design, these buildings are of steel frame construction and the walls are faced with red brick, broken with large window areas in steel sash and trimmed with art stone. They have roofs of the modified monitor design with intermediate A-frame monitors.

Much attention was given to the provision and distribution of sufficient window area and type of glass, to secure good diffusion of light at an intensity to insure adequate daylight illumination throughout the buildings. While a minimum intensity of 10-ft. candles is generally regarded as sufficient to provide satisfactory lighting for most manufacturing operations, the lowest intensity in these buildings is 22 ft.-



INSULATED Wire Plant in Foreground and Cable Plant in Middle Distance. The sea-wall at upper right incloses "made" land for the shipping facilities, deep water being available right up to the wall



INTERIOR of the Cable Plant During Construction, Showing the First Traveling Crane in Place

candles and the average is 30 ft.-candles. The windows in the side walls, except the two bottom rows, are hammered glass. This was chosen because it diffuses the rays of the sun and is not intensely luminous, as are some types of glass. Thus the workmen will not be troubled with an intense glare when the sun is shining brightly. Clear glass is used for the two bottom rows of window panes, to permit those inside to see what is outside.

Getting Rid of Radiant Heat

Amber-tinted glass is used on the south sides of the roof monitors, to filter the heat rays from the sun during the summer months and to reduce the glare of direct sunlight. Shutting out the heat rays relieves, at least in part, the discomfort workmen feel when exposed to the radiant heat transmitted by large areas of ordinary glass. Hammered finished glass is used on the north sides of the monitors, where there is no direct sunlight.

The restaurant, across the main highway opposite the cable plant, will be reached by a pedestrian tunnel from the basement of the cable plant. It will occupy a one-story brick and stone building approximately 80 x 200 ft. The main dining room will be 55 x 200 ft. and the kitchen will extend along one side, the entire length. The restaurant will be of the cafeteria type, with four serving lines, and a capacity for seating approximately 1000 employees at a time.

Dining Room a Virtual Clubhouse

In addition to making provision for serving a large number of persons quickly, the dining room will be an artistic structure, providing cheerful surroundings and making it somewhat more than simply a place in which to eat. The large dining room will have no building columns, will have insulating features to reduce noise, and large windows looking out over the water. Landscaping with trees and shrubs will help to make it a pleasant noonday retreat for those members of the organization who will use it.

Broening Highway, extending through the site, is 160 ft. wide, including sidewalks. It will have a 50-ft. paved roadway and a double-track street railway extending to the end of the Point, where the cars turn on a loop. Loading platforms will permit 2000 passengers to board the cars at one time. Beneath the highway at convenient points will be eight under-passes or tunnels, assuring safety for pedestrian traffic between the plant and parking lots.

Landscaping Between Buildings

All buildings are being set back from the highway a sufficient distance to allow for landscaping. Paved roadways, 28 ft. curb to curb, will extend between the main buildings and these will be 60 ft. apart, to provide space on either side for landscaping.

Electricity for power and light will be supplied by a public service corporation. The powerhouse will furnish process steam and heat. Its stack, 250 ft. high, is supported on the steel building structure, the bottom being 50 ft. above the ground, instead of being built from the ground up.

Cooperation Between Builders and Owners

This entire building operation, including planning and construction up to its present stage, has been handled by one organization, the H. K. Ferguson Co., Cleveland, acting in cooperation with the engineering executives of the Western Electric Co. By thus combining engineering and construction services, there is no division of responsibility among various engineers and contractors, should any difficulties arise.

Steel Treaters Hold Group Meeting

Four Chapters Gather in Newark in Joint Session—Visit Plants and Hear Technical Address

THAT group meetings of various chapters of the American Society for Steel Treating are popular was strikingly demonstrated on Friday, May 23, when 500 members of four chapters gathered in Newark, N. J., for a day of pleasure and profit. So successful was this event, and one or two others of similar nature recently, that such meetings may become a fixed policy of the society, eliminating the more formal technical gatherings, such as the semi-annual conventions.

By invitation of the New York and New Jersey chapters, which acted jointly as hosts, the Philadelphia and Lehigh Valley (Bethlehem - Easton) chapters joined in an all-day gathering at Newark, the home of the New Jersey chapter, last Friday. By noon nearly 400 had registered and, before the day's events were brought to a close, the total was approximately 500. This is the largest chapter group meeting of the A. S. S. T. ever held and resembled a regular convention in spirit and enthusiasm. A temperature of nearly 90 deg. did not mar the activities.

Philadelphia chapter members to the number of 125 came in three buses and private cars with about 40 from Bethlehem and Easton. The remainder were made up of members of the New York chapter, which has about 380 members, and the New Jersey chapter, which has about 220.

How This Group Meeting Originated

A year ago the Lehigh chapter invited the Philadelphia and New York chapters to a group meeting in Bethlehem, Pa., which was the origin of the present movement. This year the New York chapter decided to reciprocate and invited the New Jersey unit to cooperate. An impression was voiced several times last Friday, in speeches and in conversation, that this year's meeting was under the auspices of the New Jersey chapter. While it deserves the utmost praise for the details to which it attended and some extras which it provided, the affair was jointly managed.

The day's program commenced with a visit to the plant of the Western Electric Co., at Kearny, N. J., where the manufacture of cable and the recovery of waste metals from old cables was demonstrated. One of the managers of the plant addressed the visitors and answered questions in the spacious and well appointed cafeteria and lounging rooms of the plant.

A Complimentary Luncheon

A complimentary lobster luncheon, furnished by an unnamed donor, was then served in the dining room of the Elks Club on Broad Street, Newark, the headquarters for the day. Nearly 400 partook of this. After the luncheon, buses and private cars transported the crowd to the plant of the Wright Aeronautical Corporation, Paterson, N. J., about 15 miles distant.

Numerous guides escorted the party in groups through this spacious new plant, where the machining, heat-treating and assembling of the aircraft engines were shown and explained. The new foundry where aluminum alloy engine parts are cast was also visited.

About 500 Attended Banquet

Returning to the Elks Club in Newark at 6.30 p.m., an excellent dinner was served to 500 steel treaters. At the head table sat Robert G. Guthrie, Chicago, president of the society; A. O. Fulton, Boston, treasurer, and W. H. Eisenman, secretary of the national office, Cleveland, as well as three members of the board of directors — A. H. D'Arcambal, Hartford chapter, Hartford, Conn.; W. B. Coleman, Philadelphia chapter, and F. T. Sisco, recently of the Dayton chapter but now located in New York. There were also seated at the same table retiring and incoming chairmen of the four chapters—E. C. Bain and E. F. Cone, New York chapter; W. R. Bennett and H. D. McKinney, New Jersey chapter; H. P. Allen and O. J. Petersen, Philadelphia chapter. R. M. Bird, past president of the A. S. S. T., Philadelphia, as well as J. F. Wyzalek, chairman of the New York-New Jersey committee of arrangements, were also at this table. Besides these there was the toastmaster, Dr. George B. Waterhouse, professor of metallurgy, Massachusetts Institute of Technology, Cambridge, Mass., and the two speakers of the evening—F. F. Lucas, Bell Telephone Laboratories, New York, and past chairman, New York chapter, and H. C. Knerr, Metallurgical Laboratories, Philadelphia. Music was furnished by an organist at the large pipe organ.

Loving Cup to New Jersey Chairman

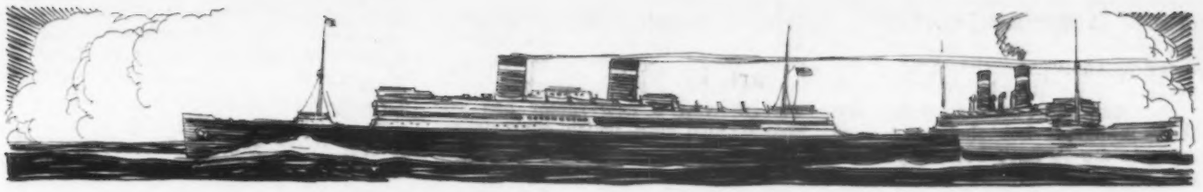
Preliminary to the formal addresses, Dr. Waterhouse called on the national officers and the representatives of the board of directors, who all made brief addresses. Each one of the chapters' retiring and incoming chairmen was introduced. A surprise followed this when Mr. McKinney, incoming chairman of the New Jersey chapter, which is only about 15 months old, and which has had a phenomenal expansion, presented Mr. Bennet, the retiring chairman, with a beautiful silver loving cup from the executive committee in appreciation of his untiring efforts in building up the chapter.

F. F. Lucas, who has a world-wide reputation for his high-power metallographic work, delivered a brief ad-

(*Concluded on page* 1652)

GROUP of National and Chapter Officers: Back Row: (from left) W. R. Bennett, retiring chairman, N. J. Chapter; W. B. Coleman, national director; R. G. Guthrie, national president; A. O. Fulton, national treasurer; F. T. Sisco, national director; A. W. F. Green, secretary, Philadelphia chapter; Edwin F. Cone, incoming chairman, N. Y. chapter; H. D. McKinney, incoming chairman, N. J. chapter, and Mr. Petersen, incoming chairman, Philadelphia chapter.

Front Row: (from left) Dr. G. B. Waterhouse, toastmaster; W. H. Eisenman, national secretary; T. N. Holden, secretary, N. Y. chapter; J. F. Wyzalek, vice-chairman, N. J. chapter; F. F. Lucas, past chairman, N. Y. chapter and a speaker at the dinner.



World Trade Is on the Mend

Reduction of Exports Is Aftermath of Tight Money Situation That Preceded Stock Crash—Easier Credit to Bring Improvement

BY JAMES A. FARRELL*

IF we will make a candid and open-minded examination of the present situation of world trade, with the purpose of disclosing its causes, so that we may guard against their repetition, we will come, as always in such cases, to certain economic facts that are of controlling importance. The position of the United States as a factor in international commerce, and our relation to the enterprise of all the world is revealed in a light that seems not to have been thoroughly considered by a large part of our people.

About two years ago there began to be observed in various parts of the world a tendency toward lessening prices, especially of raw materials. A lowering of prices that springs from lessened costs of production is not likely to have disturbing effect upon general trade. It is more probable that it will be localized in result, and ultimately beneficial rather than otherwise. But a decrease in prices that indicates an intensive effort to dispose of products in a saturated market; or that is an attempt of the producer to carry on at full speed in spite of diminished purchasing power in his field of distribution; or that points to a development of competition beyond the stage of due regard for production costs, is practically certain to lead to disadvantageous results.

Two Years of Tight Money Hurt Exports More Than Stock Crash

At the present time we have met, it seems to me, another important situation that may have been a strongly influential factor in bringing about the reduction of prices that has continued for the last two years. That is the condition that has obtained during the same period in the American money market. I know it is not unusual to refer to the dramatic collapse in the security markets last fall as a prime cause of present conditions in foreign trade. But it occurs to me that the conditions in the money market that preceded for nearly two years the spectacular events of October and November are much more likely to have exerted extensive influence on international commerce than did the abrupt return to a more nearly normal situation.

A circumstance that bears directly on international trade is the ease, or lack of it, with which exchange may be obtained in any market to meet obligations due in other countries. Sufficient exchange available at reasonable cost and without trouble facilitates trading conditions. On the other hand, scarcity of exchange, so that it is obtainable only with difficulty, sometimes amounting to hardship, and at premiums that may run to almost prohibitive rates, is bound to produce a distinctly adverse effect.

At the present time Australia, because of the lack of sufficient supply of exchange, has erected trade barriers. Similar conditions recently existed in Brazil.

Enterprise Was Stifled

There can be no doubt that conditions in the American money market for the last two years adversely affected the supply of foreign exchange, particularly of dollar exchange, available in many of the markets which are usually good customers for American products in great variety and volume. Rates for the use of money here rose to a point which made it difficult, if not impossible, for many of those in other countries who had need of capital, and could offer sound security and usually advantageous terms to American lenders, to obtain here the funds they required. In many cases this resulted in postponement or abandonment of enterprise that might have given employment to workmen, developed local production, and in other ways maintained or stimulated the purchasing power of the borrowing market.

Free capital in this country turned from foreign investment to the more highly remunerative speculative markets at home. The result was a sharp decrease in foreign investments, and correspondingly in the supply of dollar exchange otherwise available for the purchase of American merchandise exports.

In consequence partly, if not wholly, of this situation, the foreign securities publicly offered in the United States in 1929 had the lowest aggregate value such offerings had had since 1923. The decrease in Latin-American issues was 60 per cent as compared with 1928. The total of foreign securities offered in the United States last year was slightly above $700,000,000 as against over a billion for each of the several preceding years. In view of these facts it is not difficult to understand the situation in several of our important foreign markets, where payment for imports from the United States is readily offered in local currency but remittance in dollar or Sterling exchange is well nigh impossible.

Commodity Stabilization Brings Aftermath

Another circumstance that has borne heavily upon the general trade situation of the world is the sharp drop in the price of coffee in Brazil. The same condition existed in West Africa in cocoa, in the Straits Settlements in rubber, in the rice markets of Indo-China, and in the sugar markets of Cuba, all of which were primarily due to the break in the long-continued, but economically unsound, effort to maintain an artificial price through governmental action.

The accumulation through this process of supplies that would last the world for two years, coupled with the fact that each year's production furnishes some addition to the surplus, created a situation that has worked serious harm. And yet in the face of this devastating and ruinous demonstration of the fallacy of that method of interfering with the law of supply and demand, there are those in our country who insist that our Government shall embark

*President, United States Steel Corporation. Abstract of an address at Los Angeles, May 21, before National Foreign Trade Council, of which he is chairman.

upon a similar experiment in behalf of some of their products.

I shall not endeavor to carry further this analysis of the cause of the present situation. No doubt other factors than those mentioned have had their influence, but those discussed seem to me to have been important. One other circumstance may be mentioned as of possible influence. We are all familiar with the necessity and value of thorough correlation of all functions in our own enterprises, and of the bad effects of failure to secure such coordination. It is the importance of what is popularly known as "team-work." It seems clear that the situation in our money market to which I have referred disturbed the financial machinery of the various world markets, which under the developments of modern communication and transportation has been knit so closely together as to be quickly susceptible to the influence of such a disturbing factor.

I have been discussing the situation that has marked various world markets for the last six or seven months, with special reference to circumstances that originated in the United States. Now a new factor has appeared, also here, which gives promise of a certain amount of relief. If it is true that the slackening of world trade was influenced to some extent by money market conditions in the United States preceding the break in the security markets, it seems also probable that the break itself may ultimately cause some measure of remedy. For it has been followed by an easing of money rates, which is already turning the attention of American investors again toward sound foreign securities.

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dullness rather than in times of boom."

Machine Tool Plant Utilization Averages 66 Per Cent

OTHER interesting data brought out at this convention included figures on the industry's plant utilization. Preliminary studies indicate that over the past ten years machine tool plant utilization averaged approximately 66 per cent of one-shift capacity. One-shift capacity is based on 48 hr. a week, 50 weeks a year.

This investigation, presented by Mr. Du Brul in an address on "What Is Normal Operation in the Machine Tool Industry," is a new project undertaken because of the important bearing of such figures on proper distribution of overhead. In any plant, it was pointed out, the fixed charges on capital invested in plant should be taken on a basis of average utilization of that plant. In view of the swift irregularity of machine tool demand, it is particularly important to the interests of owners and stockholders to assure proper handling of this cost factor.

This initial study of capacity is based on the association's Index of Machine Tool Orders, which covers a period of 11 years. The method of arriving at the 66 per cent plant utilization is outlined in the following paragraphs.

Only 47 Per Cent Average Operation During Lean Years

From the accompanying chart it will be seen that in volume of orders received there are marked variations between different months, as well as between different years. The year 1929 stands out as highest; 1928 and 1929 average 259 scale points per month as against 232 in the two previous boom years, 1919-20. On the quarterly basis, on the other hand, the maximum quarterly average of the earlier boom stands at 363 as against 321 in 1929. However, the 1919-20 boom shows only 14 months above 200 on the scale, whereas the 1928-29 boom shows 22 months above the 200 scale point. The earlier boom was thus comparatively short and sharp, and although the peak in 1928-29 was not so high, its level was sustained 50 per cent longer, earning for itself designation as the Big Boom.

Between these two boom periods are seven lean years, with a monthly average of 113 as against the 245 of the four boom years.

From these figures, said Mr. Du Brul, it appears that to supply the average demand of the four boom years, the machine tool industry carried plant assets 53 per cent of which was not used during the seven lean years.

Although the figure of 330 scale points might be taken as the extreme capacity of the industry in 1929, such high output was obtained only by overtime and double-shift operation, and is not to be taken as normal capacity and used as a basis of managerial policies, pricing or costing.

In the absence of more definite figures than those available for the present study, about 260 is estimated as the normal one-shift capacity of the industry at this time. This figure, it was said, may be somewhat high, inasmuch as it assumes that only 20 per cent of the known peak shipments were due to operation over one-shift capacity. The average monthly demand for the past five years, which includes the two boom years and three that were decidedly lower, was 193. Therefore if the one-shift capacity is now 260, the industry managed to get 74 per cent utilization of this capacity during the last five years, with all the extra cost effort involved in the latter part of 1928 and through 1929 to make shipments.

Averaging the demand from 1920 to 1929 gives 151 on the order index scale, resulting in an average utilization of 57 per cent of present capacity. Eliminating both the boom and depression years from 1919-1922, demand over the last seven years averaged 171, which is less than 66 per cent of the 260 level estimated above as the one-shift capacity.

To obtain the rate of return on capital employed that one large automobile company has set up for itself, it was stated that the machine tool industry should aim to earn 15 per cent or better, valuing plant assets at present-day reproduction values. Furthermore, this 15 per cent should be earned by normal operation at two-thirds of one-shift capacity, or equivalent to 174 on the Order Index Scale.

On this basis the tools shipped in 1929 should have brought in over 30 per cent on the capital employed, said Mr. Du Brul. But profit reports showed that even in this big boom year the leading machine tool builders as a group fell far below the actual rate of automobile and automobile accessory companies in 1929.

Machine Tool Exposition Date Set

Sept. 10-17, 1932, are the dates selected for the next National Machine Tool Builders' Association Exposition. It will be held in the Cleveland Public Auditorium, as heretofore, but more space will be taken. Roberts Everett has again been retained as exposition manager. Sept. 10 and 11 are to be "pre-view days," for the benefit of machine tool builders and dealers. R. E. Flanders, manager Jones & Lamson Machine Co., is chairman of the exposition committee.

Improved Machines at Leipzig Fair

This year's Leipzig Fair, and particularly the improved machine tools shown there, were interestingly described by D. B. Burleigh, sales manager Sundstrand Machine Tool Co.; F. L. Eberhardt, president Gould & Eberhardt, and H. E. D. Gray, secretary Landis Tool Co., at the second general session.

All of these reviews seemed to indicate that in design and workmanship and in distribution methods the German machine tool industry has shown marked improvement and is, therefore, to be regarded as a stronger competitor than heretofore in export markets.

A few years ago machine tools similar in design to those of American builders were numerous, but they were less powerful and were lacking in important features; in methods of tooling they were far behind the American industry.

Machines on view this year were decidedly improved in appearance, and in quality of materials, hard high-tensile cast iron, containing nickel and refined in electric furnaces, being used extensively. Due to cooperation of German motor manufacturers, machine tools equipped with direct-connected motors presented an unusually pleasing appearance. Motor control boxes were built into the machines, and organized standardization in the matter of motor mountings, handwheels, levers and many other details was apparent throughout. Many machines were equipped with speed and feed indicators as regular features, as well as with devices showing power consumption. Hydraulic feed and control has been actively exploited. One example cited was a 20-in. lathe the spindle of which was hydraulically rotated, giving close speed control. Another was a large planer. A hydraulically-actuated saw was said to have operated with marked efficiency on large-diameter bars and on structural sections.

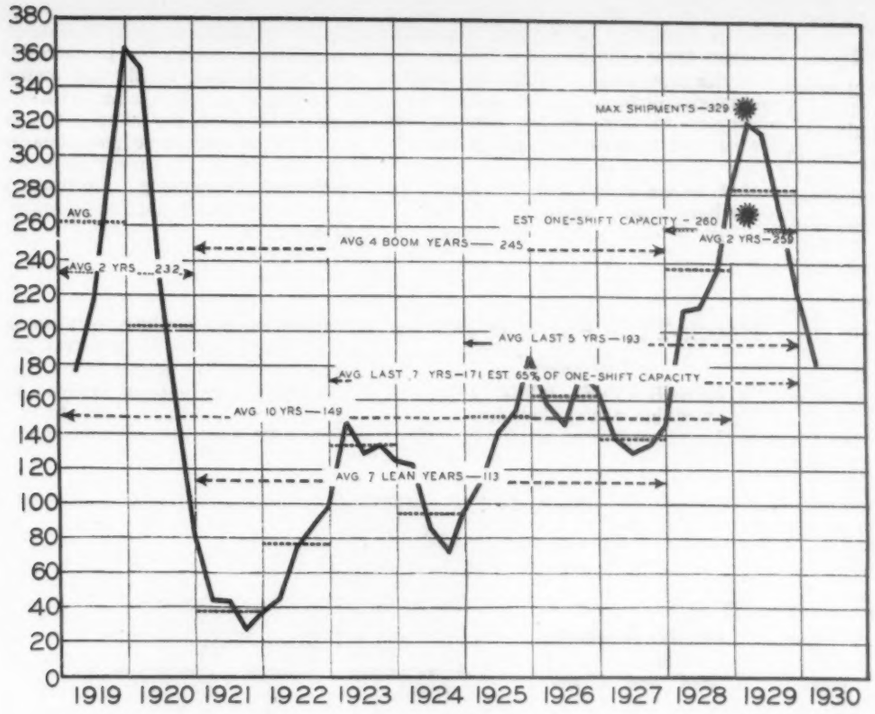
Features of the International Engineering Congress in Japan were outlined at the same session by W. P. Hunt, president Moline Tool Co., and by H. M. Lucas, president Lucas Machine Tool Co.

Closer Control of Sales Cost

In an address on "What Is Ahead in the Marketing of Industrial Products," E. J. Mehren, vice-president McGraw-Hill Publishing Co., at the informal dinner May 19, pointed out that, since the war, manufacturers have taken a new attitude toward distribution.

Sales absorb a greater percentage of gross receipts than they did 10 or 15 years ago, while production costs are actually lower, or at least no greater, than they were 10 or 15 years ago. There is an increasing consciousness of this spread between the cost of production and the cost of sales.

The first step in breaking down the process of selling with a view to controlling sales and sales cost is to determine one's own sales position. With this as a point of departure, determine your larger market, that is, set up your objective. Suit your sales organization to your product, and investigate the possibility of breaking down sales resistance by redesigning your products so that they will most suitably meet the needs of buyers. In connection with this redesign, or recreating, of products, Mr. Mehren pointed out that manufacturers are coming more and more to the attitude



INDEX of Machine Tool Orders, By Quarters, Arranged as a Calendar Outline to Show Quantities Rather Than Trends

This chart was used as the basis for the machine tool plant capacity study presented by E. F. Du Brul, general manager of the National Machine Tool Builders Association, at the twenty-eighth spring convention of the association, as noted in an adjoining column.

The upper asterisk shows (in scale points) the maximum shipments during the 1928-29 boom, and the lower asterisk shows the estimated one-shift capacity on which proper distribution of overhead may be based. An actual survey of one-shift capacity to get closer figures on plant utilization is planned.

that "nothing is constant except change."

Closer control of sales and a narrowing of the spread between production and sales costs are, in brief, what is ahead in the marketing of industrial products.

Cost Work Effective

One of the most active of the association's projects is its uniform cost accounting work. Since joining the staff some 21 months ago, A. E. Grover, cost consultant, has paid several visits to member plants, has held 19 regional cost meetings and one general cost conference. The latter, held in Cleveland and reported in THE IRON AGE of May 1, was conspicuous for large attendance and active discussion. Twelve sizable Uniform Cost Method Bulletins have been issued and another, on the Cost of Selling, is in preparation. A second general conference with Analysis and Control of the Cost of Selling as the major topic is planned for next September.

The relative benefit of devoting cost control effort to labor, material and burden, respectively, was shown on a large chart displayed by the cost group during the convention. On this it was estimated that one dollar spent on burden control would bring in four times that spent on labor control. In commenting on the showing of this chart, Mr. Du Brul pointed out that surveys of cost practice in any industry show that burden accounting is usually the weakest part of the cost system.

What Is a Machine Tool?

To facilitate passing upon applications for membership in the association, discussion of "What Is a Machine Tool?" was included on the program of the meeting. After reviewing all available definitions, including that adopted by the association in 1910, R. E. Flanders, manager, Jones & Lamson Machine Co., proposed two of them for consideration of the board of directors. One is of narrow scope and the other is of broad scope; neither is intended as an academic or dictionary definition. They are:

"1. A machine tool is a power-driven tool, not portable by hand, used for cutting metal.

"2. A machine tool is a power-driven metal-working tool whose principal use is in the production of component parts of machinery."

Standard clauses for sales proposals were submitted as recommended practice by the committee on standard proposal form, which is headed by W. W. Tangeman, vice-president Cincinnati Milling Machine Co. After discussion and some revision, the committee's recommended practice was accepted, effective Sept. 1.

Memorials of the passing of the following members since the fall meeting were made part of the records of the convention. It was also voted to transmit a copy of the resolutions to the families and business associates of the deceased members, who are:

Augustus H. Bullard, secretary and treasurer Bullard Co., Bridgeport, Conn., died April 5.

Perrin G. March, founder and president Cincinnati Shaper Co., died Feb. 26.

David C. Klausmeyer, vice-president Cincinnati Bickford Tool Co., died Dec. 6, 1929.

Frank G. Hoffman, sales manager of the machine and small tool divisions Barber-Colman Co., Rockford, Ill., died Feb. 10.

It was also voted to send to Ambrose Swasey, and the officers and employees of the Warner & Swasey Co., Cleveland, a message of congratulation on the occasion of that company's fiftieth anniversary celebration on May 23.

A. S. T. M. Nominates New Officers for Next Year

New officers for the coming year for the American Society for Testing Materials have been nominated as follows by the committee on nominations:

For president: K. G. Mackenzie, consulting chemist, The Texas Co., New York.

For vice-president: Cloyd M. Chapman, consulting engineer, New York.

For members of executive committee: F. H. Jackson, senior engineer of tests, United States Bureau of Public Roads, Washington; Dr. Zay Jeffries, consulting metallurgist, Aluminum Co. of America, Cleveland; H. H. Quimby, consulting bridge engineer, Philadelphia; G. A. Reinhardt, director of metallurgy and research, Youngstown Sheet & Tube Co., Youngstown; H. N. Van Deusen, materials engineer, Bell Telephone Laboratories, New York.

There are to be five members instead of four in the executive committee, in accordance with a revision of the by-laws adopted last year. These nominations will be acted upon at the annual convention in Atlantic City, N. J., June 23 to 27.

Makes Cast Iron Pipe for Wrought Pipe Uses

CAST iron pipe of relatively small diameters and capable of being threaded on the site of installation, as in plumbing and heating work in buildings, is a product of the American Radiator & Standard Sanitary Corporation. Percival H. Seward, of that company, told something of it at a meeting of the American Society of Sanitary Engineers.

This pipe, as he describes it, is obtainable in the same inside and outside dimensions as wrought pipe and may be cut at random and threaded and fitted as is done with the wrought product. Admitting that the threaded joint requires a resiliency in the pipe itself, he points out that the new product is an alloy cast iron that meets this and other special requirements. Included among these is strength with a deflection range and resistance to shock greater than in ordinary commercial cast iron.

The original conception of a threaded cast iron pipe seems to have been in connection with its possible use for condensation lines of steam heating systems, where the cast iron fittings to which the pipe was attached did not show pitting or corrosive influences.

"Prior to four years ago," he said, "some commercial cast iron pipe was made with enlarged or reinforced ends on which a male thread could be cut, but there seems to have been no recognition whatsoever of even the possibility of such a product as is on the market today."

The new development appears to be a pipe that may be used for all sorts of piping work except where actual bending is required or the forming of coils or long sweep turns. The regular pressure tests applied to piping are given the cast iron product and the dimensions are the same as for the wrought product except that the cast pipe is at present made in the thickness of the extra strong grade.

In short the pipe takes standard screw thread fittings, is subject to the working pressure of standard weight wrought pipe, and may be cut into nipples or any desired lengths by means of regular cutting and threading tools. It is emphasized further that welded joints may be made, as for long lengths or other purposes.

Mr. Seward addressed himself in his discussion to economic advantages of the product, including inherent strength and resistance to corrosion, and he intimated briefly the method of manufacture as being with dry sand molds with dry sand cores, together with special cupola heating and mechanical equipment to insure uniformity of pouring. Cleaning is done in a tumbling machine to remove surface sand.

Bench-Type Portable Power Threader

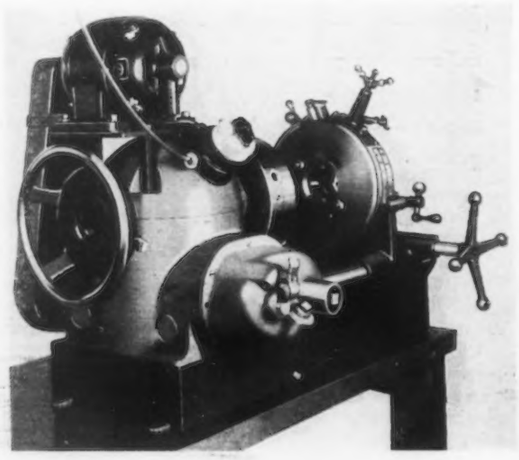
A BENCH-TYPE Willie Williams portable power threader, as well as the pedestal type, can be furnished by Oster Mfg. Co., Cleveland. Both are fitted with domestic electric motors.

It is said that either type gives the operator all the advantages of a complete large power machine, but with the added feature of portability.

It is claimed that this new motor not only speeds up the production of the machine, but also eliminates any tendency toward stalling, because the speed of the motor is in direct proportion to the pull on the dies.

Among other features claimed for the Willie Williams are the built-in cutting-off, reaming and chamfering tools, the built-in quick-opening die head that eliminates backing off, the geared oil pump and two powerful chucks. One is a heavy gripping chuck and the other a self-centering universal chuck.

Both the bench type and pedestal type machines will thread, cut, ream and chamfer all sizes of pipe from ¼ in. to 2 in.



PIPE From ¼ to 2 In. May Be Rapidly Threaded, Cut-Off, Reamed and Chamfered On This Motor-Driven Bench-Type Machine. A pedestal can be furnished if required

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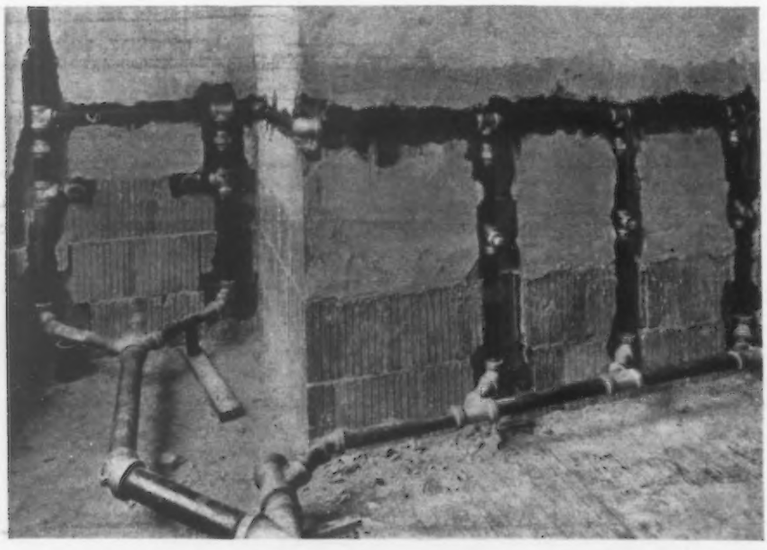


Piping Is of Cast Iron Cut and Threaded on the Job

American Steel & Wire Co. has placed orders with General Electric Co. for electrical equipment for its new rod mill at Donora, Pa. These include two 4500 h.p., 156.5 r.p.m., 6600-volt, 3-phase, 60-cycle mill type synchronous motors, a 1000-kw. motor generator set, an exciter set, 12 65-h.p. reel motors, control equipment, transformers, and auxiliary equipment. Orders for electrical equipment for the new billet mill at Donora will probably be placed within a few days.

Norton Co., Worcester, Mass., abrasives and grinding equipment, will increase its capitalization from $14,000,000 to $18,000,000. The difference, $4,000,000, is to be distributed to stockholders as a stock dividend, and represents the amount of money spent for plant improvements in recent years.

General Recovery Expected in Autumn

BY LEWIS H. HANEY

Director, New York University Bureau of Business Research

Favorable Factors

1. The rate of decline in raw material prices has become less sharp.
2. The decline in building activity is checked.
3. Decline in employment was apparently checked in April.
4. Imports increased in April.
5. Excess stocks of automobiles reduced; General Motors dealers sell more cars than they buy.
6. Banking data show signs of improving; member bank investments increase; net demand deposits rise; net reserves high.
7. All money rates definitely below the bond yield, with time and call money lower than commercial paper.
8. Business men now face the facts of depression.

Unfavorable Factors

1. Commodity price decline continues, with considerable maladjustment among different groups.
2. The P-V line declines and is below normal.
3. Production not sufficiently curtailed to adjust supply to demand; stocks of manufactured and semi-finished products large in many lines.
4. Maladjustment in the automobile industry not completely corrected.
5. Exports decline.
6. Farm purchasing power low.
7. Railroad freight traffic and earnings low.
8. The bond market makes little progress, hindering financing.
9. Collateral loans too large; loan-deposit ratio still abnormally high.
10. Political conditions unsettled.
11. Precedent is against early return to normal, after such severe over-production and credit strain.

BUSINESS factors continue to show an unfavorable balance. No distinct sustained recovery in business is to be expected before autumn—a conclusion based largely on the probability that considerable time will be required to allow the restoration of a normal adjustment of supply to demand, and to carry out the liquidation of stocks of commodities and large collateral loans.

There are no barometric data which forecast any early upturn. The increased weakness in the steel trade, following the January-February spurt, is an unfavorable indication. The automobile industry is probably not much over half way through the job of cleaning house. Exports show no sign of recovery. The depression is world-wide, and, though improvement still seems likely by October, it is doubtful if normal conditions can be restored by the end of the year.

Poor Demand Depresses Prices

PROBABLY the most significant factor continues to be the generally poor demand for commodities. This appears in weak prices and low money rates. The fundamental causes are the existence of large excess supplies, and a widely reduced purchasing power. Large supplies of commodities have the effect of reducing what economists call the "marginal utility" of commodities, i.e., the intensity of the buyers' desires. Not only do they increase selling pressure, but they reduce bids.

As to purchasing power, though employment and payrolls decreased slightly less than usual for the season in April, there has been no appreciable improvement. For example, the Illinois Department of Labor reports that "factories of the State are employing 7.8 per cent fewer workers and paying out 15.3 per cent less in wages" than a year ago, and adds that "shorter operating schedules this year are mainly responsible for the fact that payrolls show a more severe decline than the volume of employment."

At the same time, farm prices and the volume of marketings of farm products are so low that the purchasing power of farmers is unfavorably affected. This appears now to be having some effect on the market for agricultural machinery.

Under these circumstances, retail trade is bound to suffer. And if retail trade declines, all trade suffers, for everything is, in the last analysis, made to supply the "ultimate consumer."

World-Wide Recession May Be Prolonged

ON top of this domestic demand condition comes the decline in foreign demand. Exports are relatively small, but are more important than their size indicates, because they are often the safety valve for surplus supplies. The United States is less self-contained than ever before.

It is short-sighted to argue that, in a situation like the present, domestic industry can pick up in those branches which are little dependent upon foreign markets and thus pull the whole of industrial activity up. If farmers cannot sell their wheat and cotton at a profit, farm machinery, railroads and other industries are depressed. If automobile and machinery manufacturers suffer in their export business, the steel industry feels the effects. It is significant in this regard that the most depressed industries are exactly those which do *not* depend on export trade—textiles and residential building.

Essentially a Buyers' Market

THE P-V line (a ratio of commodity prices to the physical volume of trade) reacted in April and continues well below normal. It is a notable fact that commodity prices have shown the most considerable recession since 1920-1921. This is the first time since 1920 that prices have declined steadily while the physical volume of commodities has been reduced during several months. Usually, curtailment of production has brought stronger markets and a rise in the P-V line.

The present situation proves that a large reduction in the general level of prices that buyers are willing and able to pay has occurred. We are in a buyers' market. This condition probably marks a second major step in the post-war deflation, the first one having occurred in 1920-1921.

This Issue in Brief

Blowpipe proves great aid to ornamental iron workers. Welded work has greater merit and is done faster. Welds cannot be seen. Cutting blowpipe is used for roughing out prior to forging, and welding pipe for joints.—Page 1591.

* * *

To test the true strength of an aluminum casting, do not cast a separate test bar. Investigation reveals that test bars cut from the castings have a strength of only 70 to 75 per cent of that of the individually cast test bar. Test bars should be machined from the casting.—Page 1598.

* * *

Open-hearth furnace of the future may be longer and wider, but not deeper. Open-hearth men see little advantage in increasing the depth.—Page 1601.

* * *

Change in gating of aluminum casting results in 50 per cent increase in strength of the casting. Porosity varies markedly with the different methods of gating. X-ray is excellent means of determining the best method.—Page 1598.

* * *

Good zinc-base die castings can be made from remelted material on most jobs, says manufacturer. But the iron content must be held down.—Page 1600.

* * *

Trouble from botton holes in open-hearth furnaces is likely to result if silica in the bottom is permitted to get above 5 per cent, when bottom is being burned in. Analyze the slag being used and mix with magnesite in the proportion of 1 to 5.—Page 1602.

* * *

Sore spot of industry is present method of employing men. "A little czar sits in the employment office," says Frigidaire executive, "and dispenses bread and butter to those seeking work. . . wholly against all ideas of justice."—Page 1605.

The man who makes castings knows more about them than the man who buys them. Accordingly, the up-to-date foundry should provide adequate engineering service, instead of merely making castings to customers' blueprints. —Page 1606.

* * *

World trade outlook is improving, says James A. Farrell. Increasing volume may be expected, as the year progresses. Easy money rates have once more turned attention of American capital to foreign investments.—Page 1616.

* * *

To filter heat rays from the sun during summer months, amber-tinted glass is used on south sides of roof monitors in new plant. Intense sun glare is eliminated by use of hammered glass, which diffuses sun rays.—Page 1613.

* * *

Steel houses can be manufactured in quantity to compete with present wood construction, says structural steel fabricator. They must be erected by skilled mechanics. But a manufacturer of steel frame houses says such a wide departure from carpentry methods is undesirable at present. —Page 1610.

* * *

Artificial price maintenance through governmental action is "devastating and ruinous," James A. Farrell points out. Cites the example of rubber, sugar, cocoa and coffee. These should prove an example to those who insist that our Government embark on a similar experiment in behalf of their products.—Page 1615.

* * *

Three-year business cycles have been the rule in the machine tool industry since 1901, with only two exceptions. Two good years, then a poor year. Bottoms of all depressions have come in the summer months. Much machine tool business is now pending.—Page 1617.

Extreme concentration of industry is revealed by the fact that 41 counties in the United States work up half of all materials used in manufacturing. Manufacturing is grouped in 16 well defined centers. Effects of irregular operation are most marked in a very few regions.—Page 1618.

* * *

Hard high-tensile cast iron, containing nickel and refined in electric furnaces, is being extensively used in German machine tools. Machines on view at Leipzig Fair reveal a decided improvement in appearance.—Page 1618.

* * *

Aluminum alloy should be poured at as low a temperature as will fill the mold readily without causing cold shuts. For best results use the metal shortly after it has reached the proper melting temperature. — Page 1599.

* * *

Orderliness has a money value in the plant. Delays are reduced, there is less unnecessary labor, and general efficiency is increased, while accidents are minimized.—Page 1606.

* * *

Forgings to be trimmed are conveyed to trimming presses on a belt conveyor. Conveyor passes along line of 20 presses and each operator picks off the kind of pieces he is trimming.—Page 1608.

* * *

Double duty performed by belt conveyor in forging plant. Upper belt carries scrap in one direction. Bottom belt conveys trimmed forgings. Scrap is handled entirely by conveyors. Conveying system has saved 30 laborers.—Page 1608.

* * *

Problem of employment stabilization lies mostly with a few big companies. Large establishments, 4 per cent of the total, employ 58 per cent of the labor.—Page 1619.

New Double Crank Press

Four-Screw Slide Adjustment with Range of 36-In. Provided—Driving Mechanism Improved

DOUBLE crank presses featuring four-screw slide adjustment have been announced by the E. W. Bliss Co., Brooklyn, N. Y. This machine has a slide adjustment range of 36 in., a marked increase over the 5 or 6 in. usual for this size of press.

Commenting upon this extra adjustment range, the company states: "The need for more flexibility in press equipment has been keenly felt by many automotive stamping plants as well as by shops engaged in jobbing or limited production work. In such plants changes of dies ranging in height from a cowl or fender die to the comparatively low die for some flat piece may occur frequently. Heretofore it has been the practice to use a press with enough die space to accommodate the highest die and to provide some system of blocking or 'ring risers' to adapt the press to the lower dies. To keep within the adjustment range the blocking is usually designed as a series of machined slabs or 'rings' from 4 to 6 in. thick and approximately covering the entire bed of the press. These must be set in the press and secured before placing the die. The blocks require as much care and time in handling as the die itself and, when not in use, their storage has been a burden to many shop managers. The extra adjustment range has proved to be a satisfactory solution of this problem."

From the accompanying illustrations it will be seen that a pair of non-adjustable pitmans, "solid connections," links the crankshaft to a substantial crosshead. The crosshead carries four nuts suitably geared to an adjusting motor and with fine adjustment by hand. The nuts revolve in unison to advance the screws which are flanged and bolted to the slide.

Advantages claimed for this arrangement are:

"The solid connections are many times stronger than adjustable ones.

"Pressure is applied to four points on the slide, instead of to two, thereby reducing the stresses and improving the alinement.

"The screws become true compressive members, being free from the bending moment due to friction which occurs in the screw of an adjustable connection.

"The air cylinder, or springs, for counterweighting the slide have only the stroke of the slide. In the usual design there must be provision for the slide adjustment as well, and press operators must always be careful, when setting a slide near the lower limit, that the pistons or springs have clearance. With this design clearances are constant throughout the whole range of movement and, the press having once been tested, there is no further concern on that score.

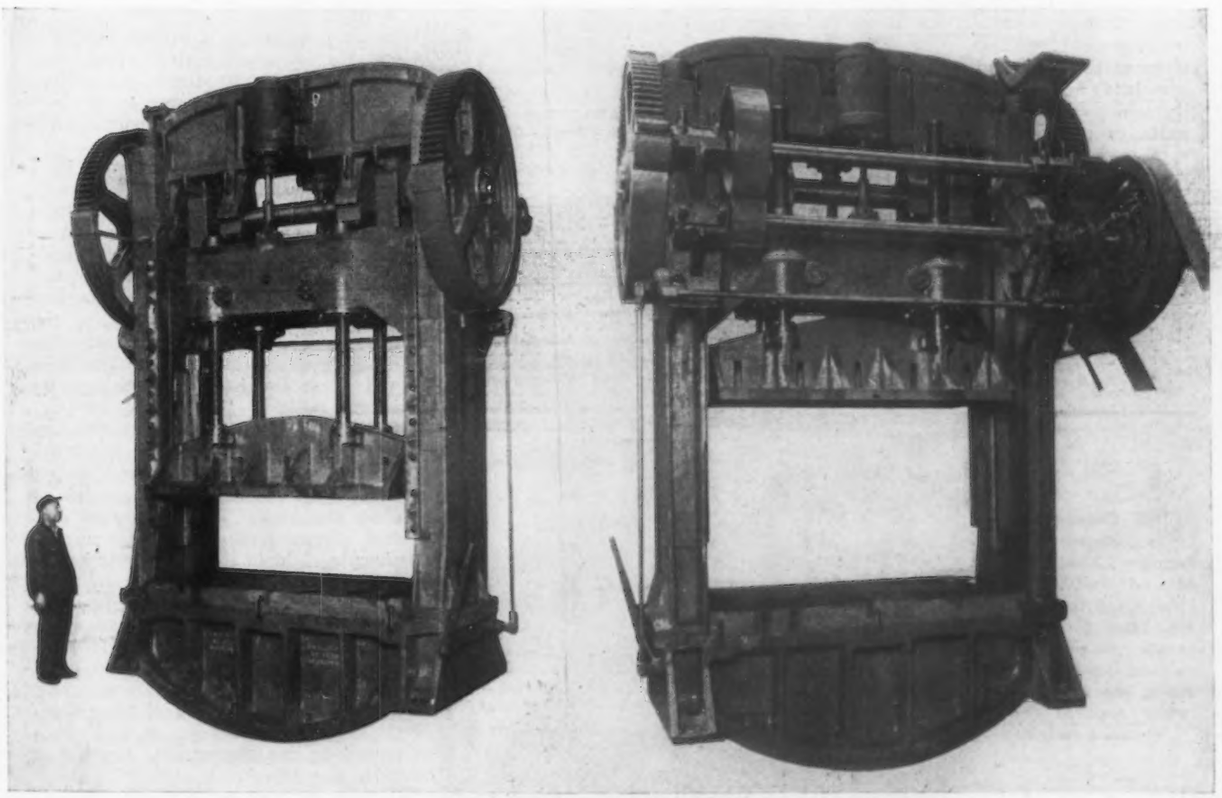
"The crosshead provides a better means for mounting the adjusting mechanism than is afforded either by the wrist or by the universal joint mounting of such mechanism."

Design of driving mechanism may be seen in the rear view illustration. The flywheel, which runs on Timken bearings, is combined with an improved multiple-disk clutch. A separate brake drum serves to keep the heat generated by the brakes away from the clutch. Removal of the outboard bearing permits removal of the clutch disks without dismounting shaft.

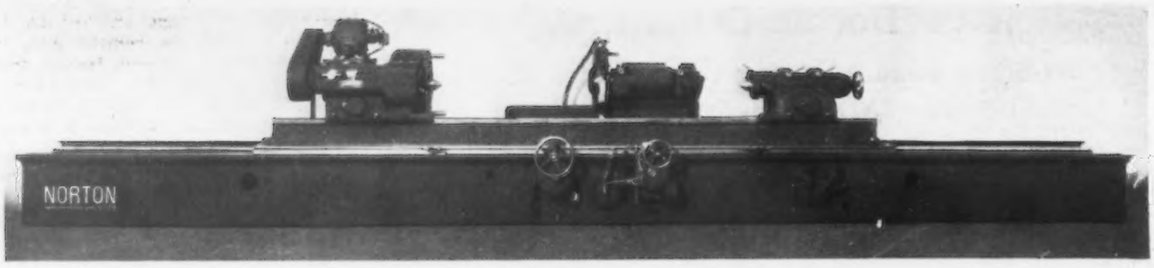
A further refinement being applied to these presses is the use of Timken bearings for the driving shaft. The Timken bearings are fitted with a "cartridge" mounting to permit the shaft and bearings to be hoisted out of the back brackets as a unit when assembling or taking down the press. In addition to the usual benefits from use of anti-friction bearings, cleaner working conditions are obtained at the back of the press.

Specifications of the No. 8E machine illustrated include:

Crankshaft and crankpin diameter, 8-9 in.; stroke, 16 in.; strokes per minute, 15; weight, 140,000 lb.; distance bed to slide, stroke down, 60 in. maximum and 24 in. minimum; width between uprights, 108 in., and floor space occupied, overall, 115 x 187 in. The machine is equipped with a 20-hp. 1200-r.p.m. main motor and a 7½-hp. 1200-r.p.m. adjusting motor.



Wide Range of Slide Adjustment Adapts This Press for Both Low and High Dies. Arrangement of the driving mechanism is shown in the rear view at right



New Roll Grinding Equipment

Heavier Machines and New Wheels Produce Accurate and Highly Finished Rolls

CUSTOMERS of manufacturers engaged in the cold rolling of steel, nickel, gold, silver, platinum, zinc, brass and foil are demanding new standards of quality both in uniformity of gage and in character of finish. As a consequence the Norton Co., Worcester, Mass., both as a manufacturer of grinding machines and of abrasives, has been engaged in mastering the problems presented. The result is the designing of heavier machines and the development of new types of wheels to produce the required mirror-like roll surfaces and at the same time to remove stock rapidly.

One of the new machines is the 28-in. type D illustrated, which is built in lengths from 96 in. up. The design is not a radical departure from the fundamental principles of previous Norton machines, but it incorporates new features. The proportions of the base and tables and the wheelslide are such as to assure rigidity, which combines with alinement of parts to produce a high quality of roll surface. Other features include flood lubrication of the table ways and the spindle bearings, the application of multiple-vee belts for driving the spindle without vibration, and the selection of grinding wheels available. The claim is made that it is possible to produce with this machine a high quality of finish with fewer wheel changes than has been the custom in the past.

Selection of wheels depends to a great extent upon the size of the roll and degree of hardness. It is pointed out by the company that the time procured in obtaining the better finish has been considerably reduced. A typical instance of the rate at which large rolls are finished is given as follows: New chilled iron rolls 24 in. in diameter and 30 in. long were ground to a highly reflective finish, removing about 0.030 in. from the diameter, in a total of 25 hr. This time included not only the roll bodies but a high finish on the necks and fillets as well. The time formerly required for this work was 39 hr.

Develops Grooving Cutters for Victaulic Joints

A CUTTER for grooving pipe and casing for Victaulic couplings has been brought out by the Landis Machine Co., Waynesboro, Pa.

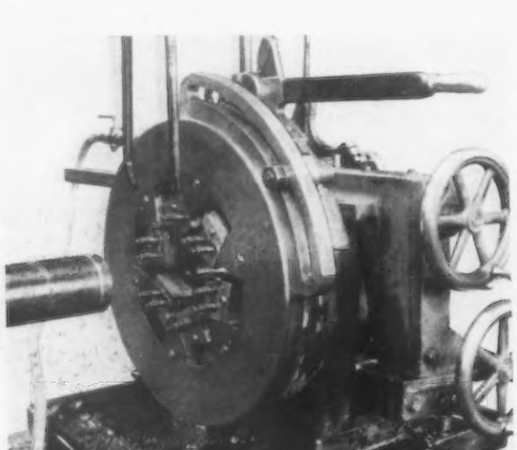
This tool, for Landis pipe-threading and cutting machines, is placed in the regular chaser holders of the stationary pipe die head used for threading standard pipe and casing. It is made on the same principle as the "long life" Landis chaser, but the thread form is omitted and the face of the cutter is flat except where the grooving offset is located. The grooving section corresponds in height and width to Victaulic standard grooves. The depth of the groove is controlled by the height of the offset on the cutter, but variations in depth of cut are obtainable by adjustment of the die head in its closed position.

The distance from the end of the pipe to the groove is located by means of two stop blocks, which are attached to two cutters, diametrically opposite each other. When the width of groove remains the same, but the distance from the end of the pipe to the groove changes, it is only necessary to replace the stop blocks with a different set. Being drilled and tapped for stop blocks, all cutters are interchangeable, and any cutter can be replaced without affecting the set.

When dull the cutters are ground on the cutting end only and moved forward in their holders to compensate for loss of metal due to grinding. As with Landis chasers the cutting edge of the grooving cutter is always on cutting center, and as it is entirely renewed at each grinding, original accuracy is maintained. The cutters are made of high-speed steel and the wear is slight; to further assure long life they are made sufficiently long to permit many grindings.

In using the grooving tool in a Landis pipe machine, the head is first adjusted to pipe size. The die head in the open position is advanced to the work by means of the carriage. When the pipe makes contact against the stop blocks, the cutters are located in the proper position for making the groove. The operator, by closing the head, feeds the cutters into the pipe, and when the head has reached its closed position the groove is completed. The groove is smooth and free from burrs, and high spots or roughness of the pipe is removed. Little effort is required of the operator to close the head. The number of cutters ranges from six in the smaller sizes to eight in the larger size heads.

These grooving cutters and stop blocks can be obtained for pipe and casing ranging from 2½ to 20 in. in diameter.



THE Grooving Cutter Is Placed in the Regular Chaser Holders of the Stationary Die Head Used for Standard Pipe and Casing. The groove obtained is of uniform depth and is well within the limits of accuracy required for the Victaulic coupling

Exports of tractors and parts from the United States set a new high record in the first three months of 1930, according to the Department of Commerce. The value registered was $35,138,000, compared with $22,180,000 for the first quarter of 1929.

Signalizes an Epochal Half Century

Warner & Swasey Celebration of Fiftieth Year Focusses on Gifts of Machine Age

CELEBRATING the fiftieth anniversary of its founding, the Warner & Swasey Co. set apart May 23 at its works in Cleveland for ceremonies which went beyond a certification of the notable successes of the partnership. This began in that city in 1880 and is now represented by the incorporation that was effected in 1900 with these same partners in the active direction of the enterprise. The exercises in fact were devoid of the self-congratulation and self-glorification of a birthday party, however much such were justified, but instead centered on the human element in industry.

There was a constant reminder of concern regarding the industrial education of the average man, the providing of opportunities for him in the shops and the industry, the spirit of cooperation as evidenced by the numbers present who had come up through the apprenticeship classes and the numbers who had served the company for long periods of years. There was also the emphasis, as in the addresses, of the great part played in human progress by the master tools of industry, as machine tools have come to be called.

Audience Pays Tribute to Mr. Swasey

Ambrose Swasey, to whom the engineering profession is so greatly indebted, as for example by his establishing and endowing the Engineering Foundation, was the central figure of the celebration. When the formal part of the afternoon was reached, he found himself, by the design of those in charge, alone on the platform, facing an audience of perhaps 2000, who arose from their seats in a main erecting bay cleared and decorated for the purpose. They vigorously applauded the lone white-haired man, while a battery of motion picture enthusiasts, professional and amateur, garnered views of the demonstration from an overhead traveling crane. Dr. Swasey was shortly joined by Philip E. Bliss, president of the company, and Dr. Dexter S. Kimball, dean of the Colleges of Engineering of Cornell University, who was scheduled to make the principal address.

President Bliss, in welcoming the guests (who included the heads of many machine tool building plants, as well as officials and employees of the company and members of their families), contended that the gathering was largely to honor the founders of the company.

Dr. Swasey, in his remarks, gave unqualified credit to the metallurgist for the great advances of this machine age. He referred to the epoch-making introduction of high-speed steel and suggested a likely revolution in machine tool design was in the offing because of the development of such cutting metals as the tungsten-carbide alloys. He paid a particular tribute to those of the company who have latterly carried on the business, asserting that they had done better than either Mr. Warner or he could have done, and he referred feelingly to his 63 years' association with Mr. Warner, who had passed away a year ago lacking one month.

Much of Everything in 130 Years

Dean Kimball's address was well received. His thesis was that the machine tool industry in 130 years had done more for humanity than all the Greek philosophers put together. He deplored the fact that handicraftsmanship without tools had been allowed so long to reign and traced the marvelous developments since 1800 when machine tools and the steam engine got under way, followed by the amazing progress in transportation and communication, until now anything is possible and likely, unless perchance it is communication with the planets.

Impressive features of the program were the awarding of prizes in the annual apprentice essay contests and the presentation of watches to the group of men who in the past year had achieved 25 years of service. In presenting the watches, Mr. Swasey likened them to animated gold medals. Informal group singing by the audience preceded the formalities, an informal reception by Mr. Swasey followed, the works were thrown open for general inspection, including that of the astronomical instruments and models of astronomical structures built by the company, and a buffet supper and dancing concluded the festivities in the shops.

Concludes with Formal Dinner

In the evening a formal dinner was given to some 35 guests in the Union Club, Cleveland. Included were Cleveland's most distinguished attorneys and bankers and a number of fellow machine tool builders from other cities. Distributed around the long table, beautifully decorated in keeping with a 50-year event, were some eight of the Warner & Swasey official family. Besides Messrs. Swasey and Bliss, they were A. C. Cook, vice-president; E. P. Burrell, director of engineering; Irving C. Bolton, treasurer; Warner Seely, secretary; William J. Burger, works manager, and George A. Decker, works engineer. Former associates were represented by Leslie B. Stauffer and William E. Reed.

The machine tool contingent included J. G. Benedict, Landis Machine Co.; Robert M. Gaylord, Ingersoll Milling Machine Co.; J. B. Doan, American Tool Works Co.; E. J. Kearney, Kearney & Trecker Co.; Henry Buker, Brown & Sharpe Mfg. Co.; Fred Eberhardt, Gould & Eberhardt; Charles Meier, Acme Tool Co.,; H. W. Dunbar, Norton Co.; John Andress, Barnes Drill Co.; H. M. Lucas, Lucas Machine Tool Co., and Ernest F. Du Brul, general manager, National Machine Tool Builders Association.

Among other guests were H. G. Dalton and William G. Mather of

AMBROSE SWASEY was the central figure of the fiftieth anniversary celebration of the Warner & Swasey Co. At his right is President Philip E. Bliss and his left Dr. Dexter S. Kimball, Cornell University

Pickands, Mather & Co.; F. G. Smith, president, Osborn Mfg. Co.; George Brainerd, General Fireproofing Co., Alex Brown, Brownhoist; Henry F. Pope, National Malleable & Steel Castings Co.; Dean Kimball, Cornell University; Dr. Robert E. Vinson, president of Western Reserve University; Dr. Dayton C. Miller, physicist; Dr. Calvin W. Rice, secretary of the American Society of Mechanical Engineers, who spoke briefly for the own-of-town visitors.

A gold medal had been struck off commemorative of the occasion and each guest found a replica of it at his place at the table. A beautifully illustrated special volume was printed to cover briefly the history of the company. In this, besides monographs on both Mr. Warner and Mr. Swasey, the story of the company's work in telescopes and precision instruments is told briefly by Mr. Burrell, that on machine tools by Mr. Cook, one on marketing by Charles J. Stilwell, vice-president and sales manager, now absent in Europe, and one on "The Future," by President Bliss, who writes: "We believe that this company, in the process of recruiting and training young men, will bring into its service energy and inventive genius sufficient to continue it in its place of recognized leadership; maintaining the fine spirit of fellowship and cooperation, with the conscious effort toward high performance which now permeates the entire organization."

Electrochemists Meet at St. Louis

Convention This Week Will See Electrical Process for Recovering Zinc from Ore—32 Papers Listed

ELABORATE preparations have been made for the fifty-seventh convention of the American Electrochemical Society. The headquarters will be the Hotel Coronado, St. Louis. Sessions will extend over three days, May 29, 30 and 31, the first two days being devoted to scientific and technical papers and discussions, a total of 32 papers being listed. Saturday will be devoted to an inspection of the lead mines and lead smelter at Flat River in the Ozark Mountains.

Electrochemists are going to St. Louis to "take possession" formally of a new territory. For many years the world has looked to the Joplin district, including the States of Missouri, Kansas and Oklahoma, for one-third of the supply of zinc or spelter. The standard process of recovering the metal from the ore has been by the so-called retort or fire process. The electrolytic method for obtaining zinc from the ore is much cheaper and the product is purer. Furthermore, valuable by-products are recovered which were formerly lost in the fire process. The electrolytic process has been used for years at other plants such as those of the Anaconda Company and Consolidated Mining & Smelting Company of Canada, but the invasion of the Joplin district by the electrochemist occurred only this year, and it is generally felt that this may mean the final chapter of the retort process. U. C. Tainton, originally of South Africa, is the originator of the electrolytic zinc process being installed at East St. Louis.

Two Valuable Rare Metals Recovered

U. C. Tainton and E. T. Clayton of the Evans-Wallower Zinc Co., East St. Louis, will describe their researches on the recovery of germanium metal. Germanium has many valuable properties. It is very resistant to oxidation and is not attacked by ordinary acids. The price of the metal today is about $1,000 a lb. but, with the new recovery plant installed, it is expected the cost will drop appreciably so as to invite new uses for the metal.

Leon R. Westbrook of the Grasselli Chemical Co. will describe his method of recovering the valuable metal, indium, from zinc ores by the electrolytic process. Indium is very ductile, it is softer than lead, and it is also quite resistant to oxidation. It has a comparatively low melting point, about 300 deg. Fahr., so that it can be melted with an ordinary match. Both the chemist and the physicist are much interested in this metal on account of its valuable properties.

Seamless Tubing by Electrodeposition

Prof. Jean Billiter, of the University of Vienna, is submitting a paper on the production of continuous and seamless tubing by electrodeposition. In other words, instead of drawing the copper tubing through a die, this tubing is made by depositing copper on a moving core. Any diameter of tubing may be made and of any thickness that may be specified.

Prof. Ulick R. Evans of Cambridge, England, is reporting on his investigation on causes and prevention of corrosion of metals. Walter H. Bruckner of Columbia University will describe how the pigment, turkey red, is made electrolytically.

Round Table Discussion on Power

Electrochemists are much dependent upon large blocks of cheap power. Within recent years marked improvements have been made in the production of power by fuel, and the development of water power has become more costly. Prof. Alexander Langsdorf of Washington University, Mo., will open the debate on "Water Power Versus Fuel Generated Power for Electrochemical Industries" to be held on Friday, May 30. Power engineers from all parts of this country and abroad will be in attendance to present their views.

Public and Utilities Construction Gains

Increase of 30 Per Cent for Four-Month Period, Reports Secretary Lamont—Highway Work Leads

WASHINGTON, May 27.—Contracts awarded for public works and utilities construction, valued at $452,910,000 for the first four months of 1930, continue at a rate well in excess of the totals for the corresponding periods of the previous 10 years, according to an announcement from Secretary of Commerce Lamont.

In view of the relatively high awards during more recent years, the gain of 30 per cent this year represents a significant and highly gratifying advance, in the opinion of Secretary Lamont, indicating effective cooperation on the part of all concerned.

The most notable gain from the standpoint of money and labor relates to contracts for highways, which reached the total of $196,678,000 during the first four months of 1930, as against $142,668,000 during the corresponding period of last year. From a percentage standpoint the largest gains in public works and utilities groups were registered in lighting systems and park developments, each of which increased 96 per cent. Water supply systems gained 66 per cent, water front developments, 64 per cent, bridges, 42 per cent, highways, 38 per cent, railroad construction, 16 per cent, and educational buildings, 3 per cent.

The heaviest decrease was in park buildings, which lost 34 per cent, followed by railroad buildings, 18 per cent, public buildings, 11 per cent, sewerage systems, 10 per cent and incinerators, 6 per cent.

In private construction, according to the Public Construction Division, Department of Commerce, the largest decline was made in awards for residential construction which dropped 49 per cent. Industrial buildings declined 24 per cent, and commercial buildings, 14 per cent.

The largest gain from a percentage standpoint was in hospitals and institutions, which increased 121 per cent.

▲▲▲ PERSONALS ▲▲▲

H. S. SCHROEDER has been appointed western sales manager for the Republic Steel Corporation, with headquarters at Chicago. He was formerly vice-president and general sales manager of the Interstate Iron & Steel Co., Chicago. H. W. CRAIG has been named district sales manager of the Chicago district for the Republic corporation, and L. S. SIMMONDS and J. F. MEHLHOPE, assistant district sales managers. Messrs. Craig and Simmonds formerly held similar positions with Republic Iron & Steel Co. and Mr. Mehlhope was formerly Chicago district sales manager for the Central Alloy Steel Corporation.

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W. H. DAVEY, president, Empire Steel Corporation, Mansfield, Ohio, sailed May 23 for a several weeks' trip abroad. He will spend considerable time in England.

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H. F. DEVENS, who for six years has been vice-president in charge of operations for the Morris & Bailey division, Oliver Iron & Steel Corporation, Pittsburgh, has been appointed vice-president in charge of sales for the Oliver corporation. For several years before going with the Oliver company, he was identified with the Superior Steel Corporation, Pittsburgh. JOHN N. CRITCHLOW, who has been general sales manager for the Oliver corporation, has resigned. H. T. THOMAS has been named assistant sales manager. For ten years he has served as assistant general manager of the Oliver company. W. B. MCKINNEY, who has been identified with the Philadelphia office of the Westinghouse Electric & Mfg. Co., has been appointed Philadelphia manager for the Oliver company, succeeding N. G. CRAIG, who has resigned to enter the investment banking business in Philadelphia. JAMES R. GILL, who was formerly general sales manager for the Foster Nut & Bolt Co., Cleveland and Chicago, has been appointed special representative for the Oliver corporation, with headquarters in Pittsburgh.

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CHARLES F. ABBOTT, executive director of the American Institute of Steel Construction, New York, spoke at a joint luncheon meeting of the Advertising Club and the Sales Managers' Bureau of the Chamber of Commerce at Hotel Jefferson, St. Louis, on May 27.

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REISUKE ISHIDA has been appointed manager of the New York office of Mitsui & Co., 165 Broadway, succeeding SHIGEJI TAJIMA, who has been made a director of the company. Mr. Ishida was manager of the company's Seattle, Wash., office during the war

H. S. Schroeder

and has since been in charge of the branches at Calcutta, India, and Dairen, Manchuria.

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DAVID O. THOMAS has been appointed general manager of the Saginaw Malleable Iron Division of the General Motors Corporation. He was general manager of the Muncie Products division of the corporation.

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A. J. WADHAMS, manager, development and research bureau, International Nickel Co., New York, delivered an address, "The Romance of Nickel," over the chain of the National Broadcasting Co. on May 27. This is one of a series of similar broadcasts designed to create greater appreciation of industry, sponsored by the Westinghouse Electric & Mfg. Co.

Richard L. Foster, former assistant general manager of sales of the American Steel & Wire Co., who has become general manager of sales of the Wickwire Spencer Steel Corporation, as announced in the May 22 issue.

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BENNETT CHAPPLE, vice-president, American Rolling Mill Co., Middletown, Ohio, was elected a director and GEORGE H. COREY, Cleveland Twist Drill Co., Cleveland, was elected vice-president of the Advertising Federation of America at its meeting in Washington last week.

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DR. C. E. KENNETH MEES, director of research and development, Eastman Kodak Co., Rochester, N. Y., will deliver the Edgar Marburg lecture at the annual meeting of the American Society for Testing Materials, Atlantic City, N. J., on June 25. The subject will be "Color and Its Measurement."

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WELTON J. CROOK has been added to the technical staff of the Axelson Mfg. Co., Los Angeles, as consulting metallurgist.

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W. N. CHILL, traffic manager, Automatic Sprinkler Corporation of America, Youngstown, has been appointed purchasing agent and in addition will direct the traffic division as in the past.

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JOHN E. CHIQUOINE, formerly chief engineer of the American Chemical Machinery Co. and later with the industrial engineering division of E. I. Du Pont de Nemours & Co., has been added to the sales staff of Blaw-Knox Co., Pittsburgh.

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GEORGE D. FROST has been placed in charge of the newly-opened sales office in New York of the Brainard Steel Corporation, Warren, Ohio.

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H. E. JOHNSON, for the past seven years sales manager of the Strom Steel Ball Co., has become identified with the Hoover Steel Ball Co., Ann Arbor, Mich.

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GEORGE E. RANDLES, president, Foote-Burt Co., Cleveland, sailed on May 21 for Europe on a two months' business trip.

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RICHARD F. STRAW, who has been identified for the past 12 years with the Wright Mfg. Co., Bridgeport, Conn., has been appointed sales manager.

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GEORGE B. GARRETT, for several years service engineer with Arthur G. McKee & Co., Cleveland, has been transferred to the sales department, and MERRILL COX, formerly with the blast furnace department of the Illinois Steel Co., has become service engineer.

CHARLES H. STAMM, heretofore sales manager of the Empire Steel Corporation, Mansfield, Ohio, has been made vice-president in charge of sales. C. H. HENKEL has been named executive vice-president, A. I. DAVEY, vice-president in charge of operations, and J. D. WADDELL, vice-president in charge of finances.

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J. A. VOSS has been appointed safety director of the Republic Steel Corporation. He formerly held the same position with the Central Alloy Steel Corporation. His headquarters will be in Youngstown and he will have charge of safety matters of all plants of the Republic corporation.

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S. O. MAXWELL, heretofore assistant New York manager of the Terry Steam Turbine Co., Hartford, Conn., has been appointed district manager, with office at 90 West Street, New York.

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HAROLD A. BACKUS has become associated with the Metallurgical Laboratories, Inc., Philadelphia, as quality supervisor. He was formerly materials engineer of Curtiss Aeroplane & Motor Co., Inc., and later assistant to the president of Berliner-Joyce Aircraft Co.

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W. B. TOPPING, western manager of sales for the Bethlehem Steel Corporation, Bethlehem, Pa., has transferred his headquarters from the Pittsburgh office to Detroit, where the company is located at 3250 Penobscot Building.

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ERVIN G. BAILEY, president, Bailey Meter Co., Cleveland, has been awarded the Edward Longstreth medal of the Franklin Institute at Philadelphia, in recognition of his inventions and developments of regulating and controlling devices, and of measuring and recording instruments. Mr. Bailey is also president of the Fuller Lehigh Co., Fullerton, Pa., and a director in the Babcock & Wilcox Co., New York.

▲ ▲ ▲ OBITUARY ▲ ▲ ▲

EDGAR REED, president and a founder of the Reed & Prince Mfg. Co., Worcester, Mass., died at his home in that city, May 20, aged 76 years. He was born in Kingston, Mass., and was educated in the schools of that town. He came of a family of manufacturers of tacks and nails; one member of the family, Col. Jesse Reed, invented the first automatic nail machine. He entered the employ of Cobb & Drew in the neighboring town of Plymouth and later worked for the Hall's Rivet Co. in the same village. Then he formed a partnership with Thomas Prince, making tacks, and presently they sold the business to the Stanley Works of New Britain, engaging themselves to stay with the company for two years. In 1886 they formed the partnership of Reed & Prince and selected Worcester as the site of their factory, because of the presence there of the Washburn & Moen Mfg Co., maker of wire, their raw material. In 1902 the business was incorporated as the Reed & Prince Mfg. Co., and Mr. Reed was the dominating factor in the management to the time of his death.

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CARL JERNBERG, one of the founders and a director of the Standard Forging Co., Indiana Harbor, Ind., died on May 19. He was also a director of the Zerozone Corporation.

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ALBERT K. SPENCER, treasurer, Wood & Spencer Co., Cleveland, manufacturer of screw machine products, and vice-president, Cleveland Castings Pattern Co., died May 22, aged 64 years.

ERNEST F. DECKER, president, E. F. Decker Saw Works, Inc, Albany, N. Y., died on May 10.

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WALTER S. MCKEE, president, Kensington Steel Co., Chicago, died on May 19 of pulmonary thrombosis which followed an operation for appendicitis. He was one of the pioneers in the manganese steel casting business and had been identified with the development of that branch of the industry for the past 30 years.

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CHARLES M. AMS, president, Max Ams Machine Co., Bridgeport, Conn., died on May 26 at his home in Pelham, N. Y., aged 63 years. Originally a manufacturer of tin cans and more recently engaged in the production of can-making machinery, Mr. Ams gained fame in the manufacture of the tin can sealed with crimped edges rather than with solder.

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PAUL A. POPPENHUSEN, a member of the firm of Acers & Poppenhusen, manufacturers of power plant equipment, died May 24 at his home in Chicago. He founded the Green Engineering Co., Chicago, of which he was president until 1924. The Green company, which manufactured chain grate stokers, was acquired several years ago by the Combustion Engineering Corporation.

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LYNFORD E. GEER, one of the founders and vice-president and treasurer of the Manitowoc Shipbuilding Corporation, Manitowoc, Wis., died of a heart attack at his home in Chicago on May 11, aged 61 years. Mr. Geer, in association with CHARLES C. WEST and the late Elias Gunnell, purchased the Burger shipyard at Manitowoc in 1902, reorganizing the business and developing it. He also was vice-president and treasurer of the Manitowoc Engineering Works, an affiliated interest.

A. S. M. E. Symposium on Tungsten Carbide

Two sessions devoted to machine shop practice, one a symposium on tungsten carbide, are on the comprehensive technical program of the semi-annual meeting of the American Society of Mechanical Engineers, to be held at the Book-Cadillac Hotel, Detroit, June 9-12.

Both machine shop practice sessions will be held on Monday, June 9. Papers at the first include: "Refinements in Finishing Cylindrical Bores," by J. W. Hindes and J. G. Young; and "What Happens When Metal Is Cut," by O. W. Boston. The symposium on tungsten carbide, to be opened by E. F. Du Brul, general manager National Machine Tool Builders' Association, will have five formal papers. They are: "Cutting Tests with Cemented Tungsten-Carbide Lathe Tools," by T. G. Digges; "Application of Tungsten Carbide to Saws," by C. M. Thompson; "Tungsten Carbide on Heavy Machine Tools," by Coleman Sellers, 3rd; "Report of Metal Cutting Committee on Tungsten Carbide," by F. C. Spencer; and "A User's Experience," by D. W. Oviatt.

"Automotive Methods and Practices Involved in Aircraft Engines and their Production," by O. E. Szekely, will be one of the papers at the aeronautics session, June 12.

A meeting of the management division on Wednesday, June 11, will have the following discussions: "Management of the Small Manufacturing Plant—Characteristics and Advantages," by Crosby Field, and "Management in a Large Plant—How to Retain the Advantages of the Small Plant," by A. B. Reynders.

Properties of metals at elevated temperatures will be discussed in three formal presentations at a session to be held the first day of the meeting, and "Tests of the Resistance of Forged, Riveted and Welded Boiler Shells to Repeated Pressure," by H. F. Moore will feature the industrial power group, June 10. Sessions will also be devoted to applied mechanics, mechanical springs and education and training for the industries.

A meeting of the Heavy-Duty Anti-Friction Bearings Committee will be held on June 11.

In addition to the 17 technical sessions, an extensive program of plant visits and sightseeing has been arranged. Entertainment features will include a boat ride up the Detroit River on the afternoon and evening of Wednesday, June 11.

Warehousemen Report Business Spotty

Members of American Steel and Heavy Hardware Association Look for Better Volume Soon

PROBLEMS of distribution, cost of doing business and cooperation as to practices between mills and distributers were the major topics at the twenty-first annual convention of the American Steel and Heavy Hardware Association, May 20 to 22 at the Edgewater Beach Hotel, Chicago.

Prevailing business conditions in the industry were summarized by E. McK. Froment, chairman of the association's committee on iron and steel. Reports from various sections of the country disclosed business as spotty, but with the trade looking for betterment in the late spring and early summer, when outdoor work is expected to become more general. New warehouses established in New York in recent years are carrying large stocks of foreign-made steel, and sales are at narrow margins. The number of these houses and curtailed demand are making market conditions unsatisfactory.

The committee which Mr. Froment heads reported favorably on the system of prices which establishes bonuses for large orders and extracts penalties for small orders. This move, which has taken strong root in the Middle West, at Buffalo, and in other market centers, appears to have carried much weight in increasing the average size of orders received by warehouses and in diverting some business to warehousemen.

Merchandising Methods Antiquated

The economic situation as it relates to distribution was divided into four major classifications by W. C. Jamison of the Bureau of Foreign and Domestic Commerce. These were stated as follows: Production, movement, financing and merchandising. Mr. Jamison attributed conditions as they now stand to lack of change in balance of these factors. Business men are too prone to know only their own business and to disregard study of the channels through which products flow in distribution.

Production has been rapidly improved, thereby bringing products many days nearer the market. Movement is now more rapid than at any time in the past. The financial structure is satisfactory. The least improvement is shown in merchandising in that it is not coordinated with the other three factors. This is the seat of many troubles. In fact, the excessive charges for use of the merchandising machinery often outweigh the advantages resulting in improvements made in production, movement and financing. It is in and around the sales department where lack of knowledge of cost prevails. He said that merchandising methods are antiquated.

E. L. Parker of Edgar T. Ward Son's Co. laid stress on the importance of service and the fact that increased earnings must come from more efficient operations. The industry is doing too much jobbing and not enough merchandising. A weak spot is that generally profits are not in line with investment and normal expectation. It might be well for warehousemen to look to lower costs of operation rather than to higher prices. It was suggested that this has been and is the procedure of the producer. Also, too many in the trade are reluctant to change wasteful ideas and practices. Report of a study made from 1923 to 1928 disclosed that the cost of goods sold has been relatively steady; cost of doing business is slowly increasing and profits are gradually declining.

Profits of members of the association showed marked increase in 1929, compared with 1928, as disclosed by A. L. Philbrick, Congdon & Carpenter Co., Providence, R. I., chairman of the committee on cost of doing business. Turnover was increased from three times in 1928 to a shade above 3.30 in 1929, an improvement of about 10 per cent.

R. H. Sanderson New President

New officers of the association are: R. H. Sanderson, Cutter, Wood & Sanderson Co., Cambridge, Mass., president; W. J. Holliday, W. J. Holliday & Co., Indianapolis, first vice-president; Guy P. Bible, Horace T. Potts & Co., Philadelphia, second vice-president. Three new names were added to the executive committee: Clarence C. Dodge, George F. Blake, Inc., Worcester, Mass.; L. H. Williams, Williams Hardware Co., Minneapolis, Minn., and Leslie Edgcomb, Edgcomb Steel Co., Philadelphia.

Industrial Marketing in New Era, Says Chapple

WASHINGTON, May 27.—High-powered explosives in the forms of advertising and swifter transportation of ideas and information through periodicals, technical journals and radio are today winning the battles of commerce.

This observation was made by Bennett Chapple, vice-president, American Rolling Mill Co., Middletown, Ohio, in the course of a discussion on what is ahead in industrial marketing at the annual convention here last week of the Advertising Federation of America.

"Ford makes a change in his model and the next morning all the world is talking about it," said Mr. Chapple. "The industry that goes into the battle for trade today without modern marketing preparation hasn't a chance against the long range, rapid fire, quickly deployed selling forces of the new order. The old respected business which has made plenty of money in the past but today is face to face with dwindling sales, dwindling profits, and dwindling prospects for the future, is a pathetic figure on industry's highway.

"What are we going to do about it?

"First, we are going to stop trying to make things to sell and begin to make things that serve. There is a vast difference, for, when selling is the chief motive of business, it is a case of every man for himself and the devil take the hindmost. Dealers are loaded up irrespective of possible markets and nothing counts at the home office but sales volume, even though the cost of high pressure methods to obtain the last 25 per cent eats up all the legitimate profit of the first 75 per cent of sales. With the mind of America concentrated on selling, all business was swept into a whirlpool of extravagance from which it is now extricating itself.

"Are we passing from the era of mergers of finance to the era of mergers of effort? I believe so. On every side we see a steady growth of highly specialized, successful small concerns which have the time and inclination to translate the ever-widening results of research into specialty machinery and specialty products. There can be no stymie of brains—and the progress of the world will always come from individual effort rather than mass production."

April Sheet Sales Above Those of March

The report for April of the National Association of Flat Rolled Steel Manufacturers shows that sales, at 300,086 tons, were somewhat larger than the 299,764 tons reported for March. Production and shipments were also higher, with 308,988 tons as the total for the former and 291,601 tons as the total for the latter.

The April report and comparisons with the two previous months follow:

Net Tons	April	March	Feb.
Capacity	540,400	521,250	486,500
Percentage reporting	67.6	67.5	67.5
Sales	300,086	299,764	203,315
Production	308,988	259,658	275,952
Shipments	291,601	275,235	241,441
Unfilled orders	526,827	524,230	517,215
Unshipped orders	126,703	116,470	125,839
Unsold stocks	81,671	75,847	75,771
Percentages, Based on Capacity			
Sales	81.5	85.1	61.8
Production	84.0	73.7	83.9
Shipments	79.2	78.1	73.4
Unfilled orders	143.2	148.8	157.4
Unshipped orders	34.4	33.1	38.3
Unsold stocks	22.2	21.5	23.1

W. W. MACON
Editor

THE IRON AGE

A. I. FINDLEY
Editor Emeritus

ESTABLISHED 1855

Car Loadings Show No Trade Gain

THE showing of freight car loadings is that there has been no progressive improvement in trade since early in the year, after allowance is made for usual seasonal variation. The statement is made on the basis of a comprehensive comparison. There have been such fluctuations that only a full comparison is likely to disclose the truth. Thus the week of April 19 showed a decrease when normally there is an increase, but there were sharp increases in the next two weeks. Then there was a dip for the week of May 10, by the report issued in the latter part of last week, which aroused unfavorable comment.

What we want to know is whether there is progressive improvement. Everyone has a definite conception of how the year started out and the important thing is comparison of the latest behavior of trade with its earlier behavior. As car loading reports are available for what the railroads call the first 19 weeks of the year, through May 10, it is convenient to ignore the week ended January 4 and take the next nine weeks, calling them the first nine of the year, and the next nine weeks, through May 10, calling them the second nine weeks. There is an increase of 3.6 per cent from the first nine to the second nine, but that is below the average of past experience. Hence it appears from these statistics that trade is not engaged in progressive improvement. After allowing for seasonal variation there is a slight decrease.

Our study brought out a remarkable point, the fidelity with which the early showing of a year corresponded with what occurred afterward. Everyone can readily recall how trade conducted itself in each of the last four years, and the car loadings that preceded are in keeping. Car loadings in the second nine weeks exceeded those in the first nine weeks as follows:

Percentage Increases of Car Loadings (Second Nine Weeks Over First Nine)

1926	4.4
1927	3.6
1928	4.5
1929	5.9
1930	3.6

One may regard 1926 as a normal or average year with respect to the distribution of its activity. In 1928 there was more activity in the second half, relative to the first half, than usual, but the extra activity began only at about the middle of the year. It is notable therefore that 1926 and 1928 showed substantially the same gain in car loadings from the first nine weeks to the second nine, 4.4 per cent and 4.5 per cent respectively.

Then for an abnormal year we have 1927, which started out quite actively but had a poor second half. It showed only 3.6 per cent increase. Finally we have 1929, when there was unusual activity in late spring and early summer. Steel production peaked in May, unprecedented, as the peak month had usually been March, occasionally April. Quite in keeping, car loadings increased 5.9 per cent from one nine-week period to the next, against smaller increases in other years.

When four successive years showed swings in car loadings quite in line with what occurred afterward the showing being made this year with its smaller increase must certainly be given serious attention.

While the swing is the more important thing, a comparison of the 18 weeks this year with the same period in other years is of interest. Taking 1926 as base the years have run as follows:

Relative Comparison of 18 Weeks of Car Loadings

1926	100.0
1927	102.3
1928	97.7
1929	101.6
1930	93.2

Is There Now a Long Swing in Trade?

AFTER the stock market collapse there was a sharp dip in general trade, particularly marked in steel, and then a substantial recovery, quite notable in the case of steel, as the February rate of ingot production was the heaviest since the preceding September. Passing the October rate was not phenomenal, however, for as a matter of fact February has done that every year since 1921.

Assuming that there was a recovery from the immediate influences of the stock market collapse, the great question at present is whether trade in general is now engaged in a long swing recovery? Some dust has been thrown in the air through references to gains that may be purely seasonal in character. It is well, therefore, to get better acquainted with seasonal swings that have been observable in the past, to make adjustments to news of activity as it comes out.

A very important trade index is fabricated structural steel lettings. In the last three years they have represented directly about 8 per cent of all the steel produced, while indirectly they have generally involved considerable additional steel. The lettings, moreover, indicate in a practical manner the views of the buyers as to the future.

A study of fabricated structural steel lettings, as reported monthly by the Department of Commerce in percentages of capacity, shows that there have been marked seasonal trends. Naturally one disregards

1920, a year of declining activity, 1921, a year of depression, and 1922, a year of recovery. The next seven years showed no long swings of great importance, and furnish a good basis for constructing a seasonal curve. In view of the danger sometimes lurking in averages it should be noted specifically that during the seven years there were no really exceptional months to distort the averages. In the whole 84 months none was below 51 per cent and none above 95 per cent, while 16 ran 51 to 59 per cent inclusive and 16 ran 82 to 95 inclusive. The average is thus quite trustworthy.

January averaged the low month, as one might possibly guess, but we doubt whether anyone would guess that December came close to being the high month or that November was the lowest month next to January. That dispels the notion that the holidays interfere with important business. Dullness on account of summer vacations is another popular notion that this study undermines, for the two high months of the whole year have been July and August.

Beginning with a low January, the average of the seven years shows a sharp mounting to March, a mild decline to May and a sharp rise to August, the peak month of the year. Then there is a general decline to a low November, but with October a little better than September, winding up with a December above the year's average and not much below July and August. To be specific, the monthly index numbers computed are as follows:

January	87.3	July	106.8
February	94.2	August	108.0
March	103.9	September	99.5
April	102.1	October	101.3
May	98.9	November	91.8
June	101.1	December	105.1

To make application of the information, this year February was 12 per cent above January and March, which were about the same, and that was not by the book. Then April tonnage was 9 per cent below the three-month average, whereas by the index numbers it should have been 7 per cent above. All told, with allowance for seasonal variation fabricated structural steel lettings have been declining since March 1. Shipments of the shops in the four months were, say, 2 per cent above those for the same period of last year.

WHAT was not said in Cleveland last week about the fiftieth anniversary celebration of the founding of the Warner & Swasey Co. may be said here. It is that it would be difficult to appraise adequately the truly large part the two founder-partners of that enterprise had in the marvelous scientific and engineering developments of the years since 1880, the most epochal half-century in human history. With rare genius for research in both pure and applied science, with vision and inventiveness, and with high devotion to the good of the community, they have meanwhile reared an industrial structure that will long endure as a monument to American opportunity and to American individualism at its best. The fact that the company has passed the fifty-year mark was not stressed at Cleveland but rather that it had attained its ripe age under the original ownership. The exercises there served to emphasize what the individual plant may do to improve the economic status of the man in the engineering trades and what far-reaching contributions to human welfare have been made by the machine tool.

Still Higher Scales of Living

DURING the last 20 years our scale of living has been improved by the widespread use of automobiles, which has been accompanied by a great use of accessories and supplies, including gasoline, and an extensive construction of improved roads. During the same period there have been introduced radiotelephony and cinematography, greatly contributing toward amusement and comfort.

There has also been born the rayon industry, increasing satisfaction in the way of clothing. There has been an immense increase in the use of the telephone and telegraph (including wireless) and of electric light and power. These things have spread into greatly increased requirement for iron and steel, copper and other commodities. Most recently has been the commercialization of the airplane.

We do not think that we have enumerated all of the improvements of the last 20 years, but those that we have mentioned have become major industries and are now giving employment to a large proportion of our workers, whose total number must be approaching 50,000,000.

Our natural increase in population would have been insufficient to supply the personnel required by these new industries, and obviously the workers required for them had to be released from other industries. This is to say that, if we were now conducting our agriculture, mining, transportation, manufacturing and merchandising in the same way that we were doing 20 years ago, we should not have available the hands for producing the new things that we enjoy. The discharge of superfluous workers from one industry does not therefore mean permanent unemployment, although it may lead to disagreeable, temporary readjustments. It is only the latter that labor leaders ever visualize.

The whole agrarian discontent may be associated with the same economic trend. The number of farmers has been diminishing because of the increased mechanization of the farms, which has enabled necessary production to be made with fewer men. The workers thus rendered superfluous have drifted to the towns, where sooner or later they have become employed in making automobiles and doing other new things.

At the present time many writers are harping upon the theme of unemployment resulting from mechanization, and many are blaming the engineers as if they had created a Frankenstein. Such an opinion is obviously based upon the assumption that there is not going to be any further improvement in the scale of living, i. e., that there are not going to be any new kinds of production. If that assumption were correct there might be ground for concern, but such an assumption in 1910 would have been incorrect and probably it is just as erroneous now. We may not be able at this moment to portray just what we shall be doing in 1940, but we have no reason to suppose that progress has been halted and we may rather imagine that it will continue in geometrical ratio.

CORRESPONDENCE

Cast Iron Holds Its Strong Position

To the Editor: On page 1484 of your May 15 issue, J. F. Lincoln, president of the Lincoln Electric Co., Cleveland, comments on the article which appeared in your May 1 issue, entitled: "Cast Iron Refuses to Step Aside." He seems to infer, in the fifth paragraph, that because all of the cast iron produced in this country is not of the highest quality, the value of cast iron is doubtful. Not all cast iron is intended to be of the highest quality. Conditions of service do not always call for the highest quality.

Following out the inference, would it be logical to assume that all welded constructions are questionable because some welds have failed? It is of course a recognized fact that welds have failed in many types of service.

The Lincoln letter also states that when irons possessing higher strengths than 15,000 lb. tensile are used, "dangerous results are encountered." Here again he seems to display a lack of knowledge of what is taking place in industry. In numerous establishments throughout the land cast irons in excess of 15,000 lb. tensile are being used with complete satisfaction. As a matter of fact, irons of 40,000 lb. tensile, and even higher, are not unusual.

In the first portion of the last paragraph an indictment is made that anything produced in a foundry is high in cost. Why have some of the country's leading manufacturing plants changed to casting construction in preference to other constructions? For no other reason than the outstanding economic advantage of cost.

The last sentence in the Lincoln letter claiming that "the field for gray iron is narrowing" is in direct contrast to the very tangible evidence presented in that writer's home city during the week of May 12. During that time the largest and most comprehensive meeting and exhibit of foundry trades ever held was staged in Cleveland, and gray iron casting production methods, equipment and wide range of uses accounted for the largest portion of the program.

ARTHUR J. TUSCANY,
Manager, Gray Iron Institute.

Cleveland.

Testing Society Plans Broad Program

Symposium on Aircraft Materials a Feature—Many Papers on Steel, Iron and Non-Ferrous Topics

A PROVISIONAL program for the thirty-third annual meeting of the American Society for Testing Materials, to be held at the Chalfonte-Haddon Hall, Atlantic City, N. J., June 23 to 27, has been made public. Sixteen sessions are provided for, including six pairs of simultaneous sessions. Metals, as is customary, will be covered at sessions on each day of the meetings. Those having to do with steel and non-ferrous metals are briefly as follows:

At the first session on Tuesday afternoon, June 24, besides reports of administrative committees, there will be a technical paper entitled "Specimens for Torsion Tests of Metals," by R. L. Templin and R. L. Moore, and one on "Elastic Behavior of Spring Materials," by M. F. Sayre. Committees which will report are those on corrosion and research; on standards, on methods of testing, on metallography, and on nomenclature and definitions.

Iron and Magnetics

For the evening of the same day a session on wrought iron, cast iron, magnetics and metals at high temperatures has been arranged. Besides reports of committees on wrought iron, cast iron, on specifications for cast iron pipe and special castings, on malleable castings and on magnetic properties, as well as a report by the joint research committee of the A. S. M. E. and the A. S. T. M. on the effect of temperature on the properties of metals, there will be two papers, one entitled "The Unbalanced Alternating Current Bridge in Magnetic Analysis," by W. B. Kouwenhoven and A. C. Seletzky, and one on "The Effect of Temperature on the Torsional Modulus of Spring Materials," by G. D. Wilson, W. P. Wood and F. P. Zimmerli.

Papers and Reports on Steel

The regular session on steel is scheduled for Wednesday morning, June 25. Three technical papers have been arranged as follows:

"The New Manganese Alloy Steels," by E. E. Thum; "The Relative Merits of Some Different Alloy Steels," by Prof. Bradley Stoughton, and "Recent Improvements in Iron-Nickel-Chromium Alloys," by N. B. Pilling.

Besides these papers there are reports of committee A-1 on steel, A-9 on ferroalloys, and A-10 on iron-chromium, iron-chromium-nickel and related alloys.

The eighth session of the convention on Thursday morning, June 26, is to be devoted to fatigue and corrosion of metals. The following technical papers are scheduled:

"Effect of Under-Stressing on Cast Iron and Open-Hearth Iron," by J. B. Kommers; "Fatigue Tests of Fillet Welds," by R. E. Peterson and C. H. Jennings; "Fatigue Studies of Telephone Cable Sheath Alloys," by J. R. Townsend and C. H. Greenall; "A Note on Fatigue Tests on Nitrided Steels," by N. L. Mochel; "The Influence of Stress and Cycle Frequency on Corrosion," by Dr. D. J. McAdam, Jr.; "A Critical Study of the Error of Averages and Its Application to the Field of Corrosion Tests," by C. H. Humes, R. F. Passano and Anson Hayes; "Some Observations on the Outdoor Atmospheric Corrosion of Zinc Protective Coatings of the Galvanized Type," by C. L. Hippensteel, C. W. Borgmann and F. F. Farnsworth.

In addition to these papers there will be reports of the research committee on fatigue of metals, of committee A-5, on corrosion of iron and steel, of committee B-3 on corrosion of non-ferrous metals and alloys, and of committee D-14 on screen wire cloth.

Non-Ferrous Topics

A session on non-ferrous metals is scheduled for Thursday evening, June 26. Besides reports of various committees there will be the following technical papers:

"Development of Zinc-Base Die Casting Alloys," by D. L. Colwell; "Silver Solders," by R. H. Leach; "The Effect of Small Additions of Nickel to a Bearing Bronze," by Clair Upthegrove, and "The Significance of Hardness Values for Some Copper-Zinc Alloys," by C. H. Davis and E. L. Munson.

A symposium on aircraft materials is scheduled for Friday morning, June 27.

Symposium on Aircraft by Testing Society

Through the efforts of a committee under the chairmanship of H. C. Knerr, Metallurgical Laboratories, Philadelphia, functioning in an advisory capacity to the committee on papers and publications of the American Society for Testing Materials, an excellent program has been arranged for a symposium on aircraft materials scheduled for the annual meeting of the society at Atlantic City during the week of June 23. Seventeen papers have been secured, each of which briefly summarizes present knowledge of some phase of the properties or testing of aircraft materials. The program is outlined as follows, the first eight papers coming in the morning and the remainder in the afternoon:

Introduction by H. C. Knerr.

"Ferrous Metals Used in Airplane Construction," by J. B. Johnson.

"Structural and Engineering Light Al-

The Week in Business

Drift of Current Financial and Economic Opinion

COMMENTATORS note little change in business conditions and business sentiment. Indications of any changes from present low levels are lacking, says one, which does not expect real improvement "until later in the year." This authority estimates the present as about 6 per cent below normal.

A financial writer finds business concerns "following extremely conservative policies and holding themselves ready to respond to the first signs of improvement," which have not yet appeared. The same verdict is reached by Alexander Hamilton Institute, which says: "Despite low interest rates, business men hesitate to borrow for industrial and commercial expansion."

Retail Purchases Are Higher

Better retail trade is noticed in several quarters, however. Union Trust Co., Cleveland, thinks this means that more people who were unemployed "are getting back on the payroll. More dollars are finding their way to the store counters and more stocks are being used up." This, it is felt, will sooner or later be reflected in increased manufacturing schedules and freight movements.

Somewhat the same condition is featured in *Business Week*, which notes that value of commodities being moved at retail is up, but that their volume is up still more. This argues lower retail prices, a fact verified from several sources. But, says that publication, "the most drastic price reductions have been due to special situations, and are not typical." Distress merchandise is blamed. We are beginning to realize that commodity stocks are larger than was thought, in the opinion of the National Industrial Conference Board.

Improvement May Be Deferred

That organization refers to the rate of business activity "so far below normal and the usually slack summer season so near at hand" as reasons for the belief that a return to normal conditions may be deferred for several months. Yet another economic unit concludes that the main trend of business is now upward and that "it can be assumed that stock prices, as a whole, will discount the better balanced business situation by perhaps several weeks."

Building revival has not justified expectations. "Construction work fails to show the improvement necessary for a general business revival," says Alexander Hamilton Institute. This was such a huge help in 1922 that *Commerce and Finance* calls it the "most powerful force in pulling business out of the despond of those years.

Wanted—A Leader

"If only one of the major industries," says that weekly, "can be kept going by psychological or credit stimulation, it will pull its sister industries up with it, as the effects of its purchases of materials and labor are felt over an ever-widening area." Failing to espy such a leader, it is concluded that business will not be *pulled* up to higher activity, but that "in all its branches it must *push* up together."

Steel is the industry to which *Annalist* looks for leadership. It seems to Mr. Baker unlikely that there will be any substantial improvement in business before the steel industry "has become stabilized as to price and rate of operations at a perceptibly higher level than that of the present." An increase of 10 per cent in rate of operation would, it is suggested, do away largely with the price cutting now believed prevalent.

Securities Outdistanced Funds

An interesting side-light on what happened last fall is furnished by a statement from the American Bankers Association to the effect that national earnings available for investment average about $600,000,000 monthly; but the issuance of securities and rights in the first half of 1929 was at the rate of $1,300,000,000 monthly, or more than twice as much. This situation is believed to have been chargeable with much blame for the excessive brokers' loans and responsibility for the panic which ensued.

loys for Aircraft," by R. L. Templin, F. V. Hartman and E. C. Hartmann.

"Structural and Engineering Ferrous Special Alloys," by Jerome Strauss, B. H. DeLong and J. A. Mathews.

"Strength and Characteristics of Wood Used in Aircraft Construction," by G. W. Trayer.

"Aeronautical Textiles," by W. E. Emley.

"Corrosion-Prevention Methods as Applied to Aircraft Construction," by H. S. Rawdon.

"Notes on Aircraft Finishes," by H. A. Gardner.

"Applications of Stampings, Forgings and Castings," by H. G. Runde.

"Materials of Construction in Aircraft Engines," by R. R. Moore.

"Failures in Aircraft Engine Parts and Causes Thereof," by T. T. Neill.

"Development of Specifications and Materials Control," by H. A. Backus.

"Mechanical Testing of Aircraft Materials," by J. B. Johnson.

"Joining Aircraft Materials, Welding, Brazing, etc.," by T. W. Downes.

"Procedure Control in Aircraft Welding," by H. L. Whittemore.

"X-Ray Testing of Aircraft Materials," by Ancel St. John.

"Photo-Elastic Studies of Aircraft Parts," by T. H. Frost.

"Heat Treatment, Process Control, and Results, Ferrous and Non-Ferrous," by H. C. Knerr.

American Refractories Institute Elects

The American Refractories Institute, Oliver Building, Pittsburgh, elected the following officers at its recent annual meeting at White Sulphur Springs, W. Va.:

President, W. J. Westphalen, vice-president, Laclede-Christy Clay Products Co., St. Louis.

First vice-president, W. B. Coullie, general sales manager, Harbison-Walker Refractories Co., Pittsburgh.

Second vice-president, P. S. Kier, vice-president, Kier Fire Brick Co., Pittsburgh.

Treasurer, C. C. Edmunds, vice-president, McLain Fire Brick Co., Pittsburgh.

Secretary, Dorothy Texter, 2218 Oliver Building, Pittsburgh.

Directors 1930-33 term: J. M. McKinley, vice-president, North American Refractories Co., Cleveland; W. B. Coullie, general sales manager, Harbison-Walker Refractories Co., Pittsburgh; C. C. Edmunds, vice-president, McLain Fire Brick Co., Pittsburgh; Roger A. Hitchins, secretary, General Refractories Co., Philadelphia; W. H. Peterson, vice-president, M. D. Valentine & Brother Co., Woodbridge, N. J.; Charles S. Reed, president, Chicago Retort & Fire Brick Co., Chicago; R. M. Sievers, district sales manager, Harbison-Walker Refractories Co., St. Louis; W. J. Westphalen, vice-president, Laclede-Christy Clay Products Co., St. Louis.

Iron and Steel Markets

Large Pipe Line Tonnages Placed

Aggregate Steel Demand Continues to Sag—Billets, Slabs, Sheet Bars, Skelp, Tin Mill Black Plate and Small Rivets Decline—Scrap Is Lower

PIPE LINE demand is the conspicuously active feature in an iron and steel market characterized by sharp contrasts. One large pipe maker is now booked for the greater part of the year and, with others rapidly building up their backlogs, utilities are hastening to enter orders, in some cases placing tentative contracts before the complete details of projects have been worked out.

Brisk business in reinforcing bars, the prospect of a continuance of the present rate of automobile production, a fair outlook in structural steel and sustained activity among shipbuilders and manufacturers of road machinery are other encouraging factors.

Aggregate demand for iron and steel, however, continues to sag and ingot production for the country at large has receded from 74 to 73 per cent of capacity. The Steel Corporation, because of its diversification, has succeeded in holding its rate at 80 per cent. Operations among independents vary widely, with some plants on a 50 per cent basis and with at least one scheduled to shut down entirely during the first week in June.

The downward trend of prices has not yet been halted. Heavy melting scrap is off 25c. a ton at Pittsburgh, Chicago and St. Louis and 50c. at Cleveland and Philadelphia. Recent irregularities in semi-finished steel have led to general reductions. Billets, slabs and sheet bars have been marked down from $33 to $31 a gross ton. Skelp is also down $2 a ton to 1.70c. a lb. Tin mill black plate is more freely available at 2.75c., Pittsburgh, a decline of $1 a ton from late minimum quotations.

Small rivets have been reduced 5 per cent, the new discount being 70, 10 and 5 off.

Light plates and blue annealed sheets are subject to more frequent shading in certain markets. On the former product 2c., Pittsburgh, is rapidly becoming the maximum price, with as low as 1.80c. quoted to preferred customers. On No. 13 gage 2.10c., Pittsburgh, is increasingly common and that figure is being undercut $2 a ton in some cases. Black sheets are also under pressure, with 2.50c. and 2.45c., base, reported on orders for high finishes taking large extras.

Fifteen per cent electric ferrosilicon has been marked down $6 a ton, from $45 to $39, Niagara Falls.

The week's pipe line awards include an order for what is said to be the longest natural gas line ever to be laid, a 1250-mile project from the Texas Panhandle to Indiana. It will be constructed by the Missouri-Kansas Pipe Line Co., which has placed the steel required with the leading pipe maker. The Southwestern Natural Gas Co. has awarded 115 miles of 16 and 18-in. gas pipe, 18,000 tons, to the A. O. Smith Corporation. The Barnsdall Corporation is reported to have tentatively ordered 800 miles of 6-in. pipe, while the Phillips Petroleum Co. is understood to have placed a provisional contract for 350 tons of 10-in.

Structural steel awards, at 31,000 tons, compare with 51,000 tons a week ago and are the smallest since the last week of April. Outstanding among fresh inquiries, which total 37,000 tons, are municipal projects in Cleveland calling for more than 17,000 tons. An unusually large public contract, in terms of iron and steel required, was the placing of 35,000 tons of cast iron segments and 3100 tons of structural steel for a subway section under the East River, New York.

Motor car production is being maintained and the expectation is that May output will equal that of April. June will show little curtailment, according to present indications, and may even register a slight gain, since larger schedules by manufacturers bringing out new models will tend to offset possible reductions by the Ford and Chevrolet companies.

Shipbuilding plants, which have the heaviest commitments in years, are submitting bids on two ocean vessels for the Eastern Steamship Lines, four for the Orient Steamship Co. and two for the Quaker City Line.

Railroad demand for steel continues to taper. Builders of rolling stock are nearing the end of their orders and specifications for rails and track accessories have fallen off. Chicago reports, however, that the decline in releases has been checked and that rail output there will hold at 80 per cent through June. The Norfolk & Western has entered the market for 40,000 tons of rails.

Tin plate output is now down to 75 per cent of capacity, except in the Chicago district.

Pig iron markets are inactive. The automotive industry is taking slightly more tonnage than last month, but demand from other sources shows a decline.

Iron and steel exports in April, at 208,640 tons, compare with 238,333 tons in March. In the first third of the year shipments of finished steel to foreign markets showed a decline of 30 per cent from those for the same period last year.

THE IRON AGE composite prices are unchanged, finished steel at 2.214c. a lb. and pig iron at $17.58 a gross ton.

A Comparison of Prices

Market Prices at Date, and One Week, One Month and One Year Previous, Advances Over Past Week in Heavy Type, Declines in Italics

Pig Iron, Per Gross Ton:	May 27, 1930	May 20, 1930	Apr. 29, 1930	May 28, 1929
No. 2 fdy., Philadelphia	$19.76	$19.76	$20.26	$21.76
No. 2, Valley furnace	18.50	18.50	18.50	18.50
No. 2 Southern, Cin'ti	16.69	16.69	16.69	18.69
No. 2, Birmingham	14.00	14.00	14.00	15.00
No. 2 foundry, Chicago*	19.00	19.00	19.00	20.00
Basic, del'd eastern Pa	18.75	18.75	18.75	20.25
Basic, Valley furnace	18.50	18.50	18.50	18.50
Valley Bessemer, del'd P'gh	20.76	20.76	20.76	20.76
Malleable, Chicago*	19.00	19.00	19.00	20.00
Malleable, Valley	19.00	19.00	19.00	19.00
L. S. charcoal, Chicago	27.04	27.04	27.04	27.04
Ferromanganese, furnace	94.00	94.00	94.00	105.00
Rails, Billets, Etc., Per Gross Ton:				
Rails, heavy, at mill	$43.00	$43.00	$43.00	$43.00
Light rails at mill	36.00	36.00	36.00	36.00
Rerolling billets, Pittsburgh	*31.00*	33.00	33.00	36.00
Sheet bars, Pittsburgh	*31.00*	33.00	33.00	36.00
Slabs, Pittsburgh	*31.00*	33.00	33.00	36.00
Forging billets, Pittsburgh	*37.00*	38.00	*38.00*	41.00
Wire rods, Pittsburgh	36.00	36.00	38.00	42.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	*1.70*	1.80	1.85	1.85
Finished Steel, *Per Lb. to Large Buyers:*	Cents	Cents	Cents	Cents
Bars, Pittsburgh	1.75	1.75	1.75	1.95
Bars, Chicago	1.85	1.85	1.90	2.05
Bars, Cleveland	1.75	1.75	1.80	1.95
Bars, New York	2.08	2.08	2.09	2.29
Tank plates, Pittsburgh	1.70	1.70	1.80	1.95
Tank plates, Chicago	1.80	1.80	1.90	2.05
Tank plates, New York	1.98	1.98	2.02½	2.22½
Structural shapes, Pittsburgh	1.70	1.70	1.80	1.95
Structural shapes, Chicago	1.80	1.80	1.90	2.05
Structural shapes, New York	1.95½	1.95½	1.99½	2.19½
Cold-finished bars, Pittsburgh	2.10	2.10	2.10	2.30
Hot-rolled strips, Pittsburgh	1.70	1.70	1.70	1.90
Cold-rolled strips, Pittsburgh	2.45	2.45	2.55	2.75

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

Finished Steel, *Per Lb. to Large Buyers:*	May 27, 1930 Cents	May 20, 1930 Cents	Apr. 29, 1930 Cents	May 28, 1929 Cents
Sheets, black, No. 24, P'gh	2.55	2.55	2.55	2.85
Sheets, black, No. 24, Chicago dist. mill	2.65	2.65	2.65	3.05
Sheets, galv., No. 24, P'gh	3.20	3.20	3.30	3.60
Sheets, galv., No. 24, Chicago dist. mill	3.30	3.30	3.40	3.80
Sheets, blue, No. 13, P'gh	2.15	2.15	2.15	2.35
Sheets, blue, No. 13, Chicago dist. mill	2.25	2.25	2.25	2.45
Wire nails, Pittsburgh	2.15	2.15	2.15	2.65
Wire nails, Chicago dist. mill	2.20	2.20	2.20	2.70
Plain wire, Pittsburgh	2.30	2.30	2.30	2.50
Plain wire, Chicago dist. mill	2.35	2.35	2.35	2.55
Barbed wire, galv., Pittsburgh	2.80	2.80	2.95	3.30
Barbed wire, galv., Chicago dist. mill	2.85	2.85	3.00	3.35
Tin plate, 100 lb. box, P'gh	$5.25	$5.25	$5.25	$5.35
Old Material, Per Gross Ton:				
Heavy melting steel, P'gh	*$14.75*	$15.00	$15.75	$17.75
Heavy melting steel, Phila	*13.00*	13.50	13.50	16.00
Heavy melting steel, Ch'go	*12.25*	12.50	13.00	15.25
Carwheels, Chicago	13.75	13.75	14.25	14.50
Carwheels, Philadelphia	*14.50*	15.00	15.00	16.00
No. 1 cast, Pittsburgh	14.25	14.25	14.25	15.00
No. 1 cast, Philadelphia	14.00	14.00	15 00	16.50
No. 1 cast, Ch'go (net ton)	12.75	12.75	13.25	15.00
No. 1 RR. wrot., Phila	15.00	15.00	15.00	16.00
No. 1 RR. wrot., Ch'go (net)	11.00	11.00	11.25	14.00
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	$2.50	$2.50	$2.60	$2.75
Foundry coke, prompt	3.50	3.50	3.50	3.75
Metals, *Per Lb. to Large Buyers:*	Cents	Cents	Cents	Cents
Lake copper, New York	13.12½	13.12½	14.12½	18.12½
Electrolytic copper, refinery	12.75	12.75	13.75	17.75
Tin (Straits), New York	*31.75*	31.37½	34.37½	43.37½
Zinc, East St. Louis	4.62½	4.62½	4.72½	6.60
Zinc, New York	4.97½	4.97½	5.07½	7.00
Lead, St. Louis	5.40	5.40	5.40	6.75
Lead, New York	5.50	5.50	5.50	7.00
Antimony (Asiatic), N. Y.	*7.35*	7.40	7.60	9.00

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

PITTSBURGH

Pipe Requirements, Chiefly for Gas Lines, Feature Otherwise Dull Steel Market

PITTSBURGH, May 27.—Anxiety on the part of oil and public utility companies to place their line pipe requirements on steel companies' books is the feature of the market this week. With the steel industry as a whole in a state of rather marked depression, the heavy tonnage going to makers of seamless and electrically welded pipe for gas and gasoline-carrying lines continues unabated.

With several hundred thousand tons of line pipe in prospect, a number of companies are reported to have placed large tonnages tentatively, even before full details of the projects under consideration have been worked out. One large maker of pipe is booked for the greater part of this year, and others are rapidly accumulating business.

During the week the Barnsdall Corporation and the Phillips Petroleum Co. are reported to have placed tentative orders, and several other projects are actively pending. As a result, pipe mill operations have been stepped up, and the seamless capacity in the Pittsburgh and Youngstown districts is being operated at at least 75 per cent.

On other steel products, dullness, which has become more marked since the first of May, is unchecked. Specifications are very light on nearly all products, and even mills which are fortified with heavy backlog tonnage are handicapped by failure of consumers to release shipments. This is particularly true in the case of rails, track accessories, plates and, to a lesser extent, on sheets and strip.

Tin plate makers, which have been accumulating considerable stocks in anticipation of releases against orders, are now shipping more material than they were a few weeks ago, but curtailed production schedules have been necessary at some points in order to bring output in line with consumption. In the Pittsburgh and Valley districts tin mills are not engaged at more than 75 per cent of capacity.

The trend of automobile production in the next few months is being studied with care, as steel makers expect slight curtailment on the part of two large makers next month. This may be offset to some extent by the heavy requirements of other motor car builders, which are preparing to change models.

Railroad equipment makers are nearing the end of their orders, and little new business has been placed in the last few months to keep them occupied. Structural tonnage is still in fair volume, and the reinforcing bar business is brisk.

Price declines are still in evidence. During the week makers of semi-finished steel have reduced their quotations $1 to $2 a ton. Tin mill black plate is more freely available at 2.75c., a decline of $1 from recent quotations, and on other flat-rolled steel products lower figures previously quoted have become more general. Quotations on bars, plates and shapes are unchanged, but competition for orders is keen, and shading has occurred on several occasions. Nail and

wire prices show some semblance of firmness at the levels adopted the first of the month.

Steel ingot operations in the Pittsburgh district are holding their own, although a downward tendency is reported from the Valleys and other nearby districts. The 70 to 75 per cent rate in effect here is held up largely by the operations of two or three large interests with a diversified line of products, as the smaller independent mills are not running so well.

The market on primary materials is very dull, and No. 1 heavy melting steel has declined 25c. Pig iron quotations are nominally unchanged, although electric ferrosilicon has been reduced $6 a ton to $39, furnace, on the 15 per cent grade.

Steel pipe orders in prospect total several hundred thousand tons.

* * *

One maker of pipe is booked for greater part of the year in line pipe sizes.

* * *

Otherwise, general steel trend is toward further slackening.

* * *

Semi-finished steel prices reduced $1 to $2 a ton.

* * *

Downward trend of scrap prices continues, with heavy melting off 25c. a ton this week.

Pig Iron.—No inquiries of importance have come out to stimulate the pig iron market, which is made up almost entirely of small orders for immediate shipment. With only three merchant stacks producing in the Valley and one in Pittsburgh, shipments are falling slightly behind production, and most of the makers will end the month with somewhat heavier stocks. No tests of the prevailing prices of $18.50, Valley, for foundry and basic iron, and $19 for Bessemer and malleable have been reported recently, but these quotations are still being adhered to on carload orders.

Prices per gross ton, f.o.b. Valley furnace:

Basic	$18.50
Bessemer	19.00
Gray forge	18.00
No. 2 foundry	18.50
No. 3 foundry	18.00
Malleable	19.00
Low phos., copper free	27.00

Freight rate to Pittsburgh or Cleveland district, $1.76.

Prices per gross ton, f.o.b. Pittsburgh district furnace:

Basic	$19.00
No. 2 foundry	19.00
No. 3 foundry	18.50
Malleable	19.50

Freight rates to points in Pittsburgh district range from 63c. to $1.13.

Ferroalloys.—Leading manufacturers of 15 per cent electric ferrosilicon have reduced the price $6 a ton to $39, furnace. The change is said to have been brought about by competition of the blast furnace grades. No other important revisions have been made in ferroalloy prices. Business is very slow. Ferromanganese is quoted at $94 to $99 a ton, and speigeleisen at $29 to $32 for the 16 to 19 per cent grades.

Semi-Finished Steel.—Sales of billets and sheet bars at $1 and $2 a ton under the recent $33 quotation have established the semi-finished steel market at a range of $31 to $32, Pittsburgh or Youngstown. The old quotation had been subject to considerable pressure in recent weeks, and sellers of this product have generally recognized the lower figures. Forging billets are also quotably lower, although no sales at less than $37, Pittsburgh, have been reported. The semi-finished market is dull, with new buying light and shipments somewhat under the April level. Wire rod prices are holding at $36, Pittsburgh, with business restricted.

Bars, Plates and Shapes.—Business shows little change, with specifications for plates and bars confined to small lots and new buying unimpressive. Consumers are showing no interest in future commitments, and recent low prices which have been named on desirable tonnages are largely the result of the mills' eagerness or tonnage. Merchant bars are moving to the automobile industry in fair volume, but signs of curtailment are in evidence. The same is true in the case of alloy steel bars.

Reinforcing bars are very active, and mill deliveries are lengthening. Most of the large projects around Pittsburgh have been placed, but shipments on these orders will continue for several months. Fabricated structural lettings have not been numerous in the last week, but larger shops are fairly well occupied and the smaller fabricators are improving their position slightly.

Prices have not changed materially, although no effort to stabilize quotations is noticed. Plates and shapes are nominally quoted at 1.70c. to 1.75c., Pittsburgh, while bars are holding somewhat better at 1.75c. Reinforcing bars are now more freely offered at 1.75c. to 1.80c.

Rails and Track Accessories.—Reluctance on the part of the railroads to specify their rail and track accessory requirements is more pronounced. A few of the larger interests are going ahead with their track laying programs, but the remainder are deferring shipments as much as possible. New buying is negligible. Consumers are seeking lower prices on accessories. Thus far the market prices are holding and larger producers contemplate no adjustments.

Tubular Goods.—With line pipe capacity in this and the Valley district rapidly being booked for the remainder of the year, oil and utility companies are anxious to place orders, and the pipe market is unique in the steel industry today because of the commanding position of the producers. Since the beginning of the month prospective lines have been rushed to the stage at which pipe bids might be asked for, and several large jobs have been tentatively placed even before right-of-way privileges have been entirely settled. This assures buyers a place in mill rolling schedules and also builds up the backlogs of producers.

The Barnsdall Corporation is reported to have placed with a Pittsburgh mill a 40,000-ton gasoline-carrying line to extend from Oklahoma to Milwaukee, while a part of a large project of the Phillips Petroleum Co. is said to have been tentatively placed with a Valley producer.

Line pipe operating schedules in this and nearby districts now average

The Iron Age Composite Prices

Finished Steel

May 27, 1930, 2.214c. a Lb.

One week ago	2.214c.
One month ago	2.242c.
One year ago	2.412c.

Based on steel bars, beams, tank plates, wire, rails, black pipe and black sheets. These products make 87 per cent of the United States output of finished steel.

	High	Low
1930	2.362c., Jan. 7;	2.214c., May 20
1929	2.412c., April 2;	2.362c., Oct. 29
1928	2.391c., Dec. 11;	2.314c., Jan. 3
1927	2.453c., Jan. 4;	2.293c., Oct. 25
1926	2.453c., Jan. 5;	2.403c., May 18
1925	2.560c., Jan. 6;	2.396c., Aug. 18

Pig Iron

May 27, 1930, $17.58 a Gross Ton

One week ago	$17.58
One month ago	17.67
One year ago	18.71

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	High	Low
1930	$18.21, Jan. 7;	$17.58, May 13
1929	18.71, May 14;	18.21, Dec. 17
1928	18.59, Nov. 27;	17.04, July 24
1927	19.71, Jan. 4;	17.54, Nov. 1
1926	21.54, Jan. 5;	19.46, July 13
1925	22.50, Jan. 13;	18.96, July 7

Mill Prices of Finished Iron and Steel Products

Iron and Steel Bars

	Base per Lb.
Soft Steel	
F.o.b. Pittsburgh mill	1.75c.
F.o.b. Chicago	1.85c.
Del'd Philadelphia	2.04c.
Del'd New York	2.08c.
F.o.b. Cleveland	1.75c. to 1.80c.
F.o.b. Lackawanna	1.85c. to 1.90c.
F.o.b. Birmingham	1.95c. to 2.00c.
C.i.f. Pacific ports	2.35c.
F.o.b. San Francisco mills	2.35c.
Billet Steel Reinforcing	
F.o.b. P'gh mills, 40, 50, 60-ft.	1.75c. to 1.80c.
F.o.b. P'gh mills, cut lengths	2.00c. to 2.05c.
F.o.b. Birmingham, mill lengths	1.95c. to 2.00c.
Rail Steel	
F.o.b. mills, east of Chicago dist.	1.65c. to 1.70c.
F.o.b. Chicago Heights mill	1.80c.
Del'd Philadelphia	1.94c. to 1.99c.
Iron	
Common iron, f.o.b. Chicago	1.90c.
Refined iron, f.o.b. P'gh mills	2.75c.
Common iron, del'd Philadelphia	2.09c.
Common iron, del'd New York	2.14c.

Tank Plates

	Base per Lb.
F.o.b. Pittsburgh mill	1.70c. to 1.75c.
F.o.b. Chicago	1.80c.
F.o.b. Birmingham	1.95c. to 2.00c.
Del'd Cleveland	1.88½c. to 1.93½c.
Del'd Philadelphia	1.90½c. to 1.95½c.
F.o.b. Coatesville	1.80c. to 1.85c.
F.o.b. Sparrows Point	1.80c. to 1.85c.
F.o.b. Lackawanna	1.80c. to 1.85c.
Del'd New York	1.98c. to 2.03c.
C.i.f. Pacific ports	2.20c.

Structural Shapes

	Base per Lb.
F.o.b. Pittsburgh mill	1.70c. to 1.75c.
F.o.b. Chicago	1.80c.
F.o.b. Birmingham	1.95c. to 2.00c.
F.o.b. Lackawanna	1.80c. to 1.85c.
F.o.b. Bethlehem	1.80c. to 1.85c.
Del'd Cleveland	1.88½c. to 1.93½c.
Del'd Philadelphia	1.81c. to 1.86c.
Del'd New York	1.95½c. to 2.00¼c.
C.i.f. Pacific ports	2.35c.

Hot-Rolled Hoops, Bands and Strips

	Base per Lb.
6 in. and narrower, P'gh	1.80c.
Wider than 6 in., P'gh	1.70c.
6 in. and narrower, Chicago	1.90c.
Wider than 6 in., Chicago	1.80c.
Cooperage stock, P'gh	2.10c. to 2.20c.
Cooperage stock, Chicago	2.20c. to 2.30c.

Cold-Finished Steel

	Base per Lb.
Bars, f.o.b. Pittsburgh mill	2.10c.
Bars, f.o.b. Chicago	2.10c.
Bars, Cleveland	2.10c.
Bars, Buffalo	2.10c.
Shafting, ground, f.o.b. mill	*2.45c. to 3.40c.
Strips, P'gh	2.45c. to 2.55c.
Strips, Cleveland	2.45c. to 2.55c.
Strips, del'd Chicago	2.73c. to 2.83c.
Strips, Worcester	2.60c. to 2.70c.
Fender stock, No. 20 gage, Pittsburgh or Cleveland	3.80c.

*According to size.

Wire Products

(Carload lots, f.o.b. Pittsburgh and Cleveland.)

	Base per Keg
To Merchant Trade	
Standard wire nails	$2.15 to $2.25
Cement coated nails	2.15 to 2.25
Galvanized nails	4.15 to 4.25
	Base per Lb.
Polished staples	2.60c. to 2.70c.
Galvanized staples	2.85c. to 2.90c.
Barbed wire, galvanized	2.80c. to 2.90c.
Annealed fence wire	2.30c. to 2.40c.
Galvanized wire, No. 9	2.75c. to 2.85c.
Woven wire fence (per net ton to retailers)	$65.00
To Manufacturing Trade	
Bright hard wire, Nos. 6 to 9 gage	2.30c.
Spring wire	3.30c.
(Carload lots, f.o.b. Chicago)	
Wire nails	$2.20 to $2.30 (keg)
Annealed fence wire	2.40c. to 2.50c. (lb.)
Bright hard wire to manufacturing trade	2.35c.

Anderson, Ind., mill prices are ordinarily $1 a ton over Pittsburgh base; Duluth, Minn., and Worcester, Mass., mill $2 a ton over Pittsburgh, and Birmingham mill $3 a ton over Pittsburgh.

Cut Nails

	Per 100 Lb.
Carloads, Wheeling, Reading or Northumberland, Pa.	$2.45 to $2.50
Less carloads, Wheeling or Reading	2.60

Light Plates

No. 10, blue annealed, f.o.b. P'gh	2.00c.
No. 10, blue annealed, f.o.b. Chicago dist.	2.10c. to 2.20c.
No. 10, blue annealed, del'd Phila.	2.32c. to 2.42c.
No. 10, blue annealed, B'ham	2.20c.

Sheets

	Base per Lb.
Blue Annealed	
No. 13, f.o.b. P'gh	2.15c.
No. 13, f.o.b. Chicago dist.	2.25c. to 2.35c.
No. 13, del'd Philadelphia	2.44c. to 2.54c.
No. 13, blue annealed, B'ham	2.35c.
Continuous Mill Sheets	
No. 10 gage, f.o.b. P'gh	1.80c. to 1.90c.
No. 13 gage, f.o.b. P'gh	1.95c. to 2.05c.
(Usual range 24 in. to 48 in. wide)	
Box Annealed, One Pass Cold Rolled	
No. 24, f.o.b. Pittsburgh	2.55c.
No. 24, f.o.b. Chicago dist. mill	2.65c.
No. 24, del'd Philadelphia	2.84c.
No. 24, f.o.b. Birmingham	2.70c.
Steel Furniture Sheets	
No. 24, f.o.b. P'gh	3.80c.
Galvanized	
No. 24, f.o.b. Pittsburgh	3.20c. to 3.30c.
No. 24, f.o.b. Chicago dist. mill	3.30c. to 3.40c.
No. 24, del'd Cleveland	3.43¾c.
No. 24, del'd Philadelphia	3.49c.
No. 24, f.o.b. Birmingham	3.40c.
Tin Mill Black Plate	
No. 28, f.o.b. Pittsburgh	2.75c. to 2.90c.
No. 28, f.o.b. Chicago dist. mill	2.90c. to 3.00c.
Automobile Body Sheets	
No. 20, f.o.b. Pittsburgh	3.70c.
Long Ternes	
No. 24, 8-lb. coating, f.o.b. mill	3.80c.
Vitreous Enameling Stock	
No. 24, f.o.b. Pittsburgh	3.80c.

Tin Plate

	Per Base Box
Standard cokes, f.o.b. P'gh district mills	$5.25
Standard cokes, f.o.b. Gary	5.35

Terne Plate

(*F.o.b. Morgantown or Pittsburgh*)
(Per Package, 20 x 28 in.)

8-lb. coating I.C.	$10.70	25-lb. coating I.C.	$15.90
15-lb. coating I.C.	13.40	30-lb. coating I.C.	16.80
20-lb. coating I.C.	14.60	40-lb. coating I.C.	18.80

Alloy Steel Bars

(F.o.b. maker's mill)

Alloy Quantity Bar Base, 2.65c. per Lb.

S.A.E. Series Numbers		Alloy Differential
2000	(1¼% Nickel)	$0.25
2100	(1¼% Nickel)	0.55
2300	(3½% Nickel)	1.50
2500	(5% Nickel)	2.25
3100	Nickel Chromium	0.55
3200	Nickel Chromium	1.35
3300	Nickel Chromium	3.80
3400	Nickel Chromium	3.20
4100	Chromium Molybdenum (0.15 to 0.25 Molybdenum)	0.50
4100	Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70
4600	Nickel Molybdenum (0.20 to 0.30 Molybdenum, 1.25 to 1.75 Nickel)	1.05
5100	Chromium Steel (0.60 to 0.90 Chromium)	0.35
5100	Chromium Steel (0.80 to 1.10 Chromium)	0.45
5100	Chromium Spring Steel	0.20
6100	Chromium Vanadium Bar	1.20
6100	Chromium Vanadium Spring Steel	0.95
9250	Silicon Manganese Spring Steel (flats)	0.25
	Rounds and squares	0.50
	Chromium Nickel Vanadium	1.50
	Carbon Vanadium	0.95

Above prices are for hot rolled steel bars, forging quality. The differential for cold-drawn bars is ¾c. a lb. higher, with standard classification for cold-finished alloy steel bars applying. For billets 4 x 4 to 10 x 10 in., the price for a gross ton is the net price for bars of the same analysis.

Billets under 4 x 4 in. carry the steel bar base. Slabs with a sectional area of 16 in. or over carry the billet price. Slabs with sectional area of less than 16 in. or less than 2½ in. thick, regardless of sectional area, take the bar price.

Rails

	Per Gross Ton
Standard, f.o.b. mill	$43.00
Light (from billets), f.o.b. mill	36.00
Light (from rail steel), f.o.b. mill	34.00
Light (from billets), f.o.b. Ch'go mill	36.00

Track Equipment

	Base per 100 Lb.
Spikes, ⅝ in. and larger	$2.80
Spikes, ½ in. and smaller	2.80
Spikes, boat and barge	3.00
Tie plate, steel	2.07½
Angle bars	$2.75
Track bolts, to steam railroads	$3.80 to 4.00
Track bolts, to jobbers, all sizes, per 100 count	70 per cent off list

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Butt Weld

Steel Inches	Black	Galv.	Iron Inches	Black	Galv.
⅛	47	21½	¼ and ⅜	+11	+36
¼ to ⅜	53	27½	½	23	5
½	58	44½	¾	28	11
¾	62	50½	1 and 1¼	31	15
1 to 3	64	52½	1½ and 2	35	18

Lap Weld

2	57	45½	2	23	9
2½ to 6	61	49½	2½ to 3½	28	13
7 and 8	58	45½	4 to 6	30	17
9 and 10	56	43½	7 and 8	29	16
11 and 12	55	42½	9 to 12	26	11

Butt Weld, extra strong, plain ends

⅛	43	26½	¼ and ⅜	+13	+48
¼ to ⅜	49	32½	½	23	7
½	55	44½	¾	28	12
¾	60	49⅞	1 to 2	34	18
1 to 1½	62	51½			
2 to 3	63	52½			

Lap Weld, extra strong, plain ends

2	55	44½	2	29	13
2½ to 4	59	48½	2½ to 4	34	20
4½ to 6	58	47½	4½ to 6	33	19
7 to 8	54	41½	7 and 8	31	17
9 and 10	47	34½	9 to 12	21	8
11 and 12	46	33½			

On carloads the above discounts on steel pipe are increased on black by one point, with supplementary discount of 5%, and on galvanized by 1½ points, with supplementary discount of 5%. On iron pipe, both black and galvanized, the above discounts are increased to jobbers by one point with supplementary discounts of 5 and 2½%.

Note.—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Steel		Charcoal Iron	
2 in. and 2¼	38	1½ in.	1
2½ in.—2¾ in.	46	1¾ in.	8
3 in.	52	2 in.—2¼ in.	13
3¼ in.—3¾ in.	54	2½ in.—2¾ in.	16
4 in.	57	3 in.	17
4½ in. to 6 in.	46	3¼ in. to 3½ in.	18
		4 in.	20
		4½ in.	21

On lots of a carload or more, the above base discounts are subject to a preferential of two fives on steel and of 10 per cent on charcoal iron tubes. Smaller quantities are subject to the following modifications from the base discounts:

Lap Welded Steel—Under 10,000 lb., 6 points under base and one five; 10,000 lb. to carload, 4 points under base and two fives. Charcoal Iron—Under 10,000 lb., 2 points under base; 10,000 lb. to carload, base and one five.

Standard Commercial Seamless Boiler Tubes

Cold Drawn

1 in.	61	3 in.	46
1¼ to 1½ in.	53	3½ to 3½ in.	48
1¾ in.	37	4 in.	51
2 to 2¼ in.	32	4½, 5 and 6 in.	40
2½ to 2¾ in.	40		

Hot Rolled

2 and 2¼ in.	38	3¼ to 3½ in.	54
2½ and 2¾ in.	46	4 in.	57
3 in.	52	4½, 5 and 6 in.	46

Beyond the above base discounts a preferential discount of 5 per cent is allowed on carload lots. On less than carloads to 10,000 lb., base discounts are reduced 4 points with 5 per cent preferential; on less than 10,000 lb., base discounts are reduced 6 points, with no preferential. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gages take the mechanical tube list and discounts. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

	Per Cent Off List
Carbon, 0.10% to 0.30% base (carloads)	55
Carbon, 0.30% to 0.40% base	50

Plus differentials for lengths over 18 ft. and for commercial exact lengths. Warehouse discounts on small lots are less than the above.

approximately 70 per cent of theoretical capacity, while buttweld furnaces are engaged at about 60 per cent. Demand for buttweld pipe is still improving slightly, but is considerably below the usual seasonal average. Mechanical tubing and boiler tubes are also quiet.

Wire Products.—The wire business is very dull, but producers have become less aggressive in seeking orders and the price structure has improved in consequence. In the Pittsburgh territory no deviations from the $2.15, Pittsburgh, quotation on nails are reported, and bright hard wire is well maintained at 2.30c., Pittsburgh. Shipments of both merchant and manufacturers' wire this month are considerably behind those of April, and new buying is negligible. Occasional talk of higher prices for third quarter may stimulate new business in the next few weeks.

Sheets.—Demand for sheets is not as heavy as it was at the beginning of the month, but the decline has been so gradual that week-to-week comparisons have shown little change. The decline has been more noticeable in production schedules, and the sheet industry in Pittsburgh and the Valleys is not running at much over 65 per cent of capacity. A few mills enjoying a fair amount of automotive tonnage are doing better, but jobbing mills have little business, and the rather steady demand for the common finishes is not sufficient to offset variable schedules in other departments.

Prospects for the summer months, while by no means encouraging, are improved by the promise of better distributed consumption on the part of the automobile industry which will soon begin work on new models. Any increase in the aggregate tonnage going to this industry is unlikely, and some curtailment is likely in June. The situation in the other large sheet consuming industries shows little change. Approaching curtailment on the part of implement makers will not seriously affect this district, but specifications of the car builders are declining as present orders are completed, and the railroads are placing little business to offset this loss.

Makers of automobile body sheets are now generally quoting 3.70c., Pittsburgh, a decline of $2 a ton from the recent price and of $8 as compared to the same time in 1929. Tin mill black plate is also available at 2.75c., Pittsburgh, although some makers are shipping some material against 2.90c. contracts. Other price changes represent a more common recognition of recent minimum quotations. Comparisons with 1929 on the common finishes reveal declines of $8 a ton on galvanized material, $6 on black and $4 each on light plates and blue annealed sheets. Tin mill black was quoted at 3c., Pittsburgh, this time last year, or $5 over present minimum quotations, while vitreous enameling stock is quotable at only $2 below the price of a year ago.

Tin Plate.—Mill operations in the Pittsburgh and Valley districts are just holding their own and are estimated at 75 per cent of capacity. In contrast, Chicago mills are running at capacity, while Eastern producers are about on a par with Pittsburgh. In the last few weeks, however, shipments of independent makers have been ahead of production and material stocked in anticipation of specifications is being reduced.

A serious frost in Wisconsin has damaged the early pea crop, and the pack of that vegetable in the locality may be reduced about 25 per cent. No other disturbing crop reports are heard, but tin plate shipments are falling behind those of last year, and it is now doubted that the loss thus far may be made up in the months to come.

Strip Steel.—Specifications for hot-rolled strip have declined slightly, but the month has shown a sharp improvement over April. Operations continue at about 75 per cent of capacity, with a few mills, which are getting heavy specifications from the automobile industry, running at a better rate. Demand from other sources is steady, but confined entirely to small lots, which provide little backlog for the mills.

Prices on hot-rolled material are unchanged at 1.70c., Pittsburgh, for stock wider than 6 in. and 1.80c. for 6-in. and narrower. Cold-rolled strip is still very dull, and price demoralization continues. The market is quotable at 2.45c. to 2.55c., Pittsburgh, with shading in evidence even on the lower figure when desirable tonnages are involved.

Coke and Coal.—With the market on furnace coke fairly well established at $2.50, Connellsville, business is well distributed among the various sellers, although the individual shares are small. Demand is confined to carload lots, and shipments are light. Foundry coke is also quiet, with prices ranging from $3.25 for distress material to $4.85 for the premium brands. Coal is quiet, with prices weak, although slack quotations are holding at recent advanced levels.

Old Material.—The downward trend of scrap prices continues, with sales of both No. 1 heavy melting steel and hydraulic compressed sheets having been made to the mills in the district at $15. One mill even bought heavy melting at $14.75. This is a decline of 25c. from recent consumer buying quotations.

The flow of hydraulic compressed sheets from the Detroit district into Pittsburgh territory has been checked further by the initial purchases of compressed sheets by the new steel plant in Detroit, which will go into operation Aug. 1. With heavy scrap tonnages moving from Detroit to Buffalo, Pittsburgh and Valley mills are experiencing added difficulty in buying this scrap for use here. With present light consumption, however, the situation has failed to strengthen the Pittsburgh market. Other grades of scrap are also lower, notably acid open-hearth materials and blast furnace grades.

The Baltimore & Ohio list, which closes on June 2, contains 17,700 tons, including 3500 tons of heavy melting steel and 5000 tons of rails.

Prices per gross ton delivered consumers' yards in Pittsburgh and points taking the Pittsburgh district freight rate:

Basic Open-Hearth Grades:	
No. 1 heavy melting steel	$14.50 to $15.00
No. 2 heavy melting steel	12.75 to 13.25
Scrap rails	14.00 to 14.50
Compressed sheet steel	14.50 to 15.00
Bundled sheets, sides and ends	13.00 to 13.50
Cast iron carwheels	13.50 to 14.00
Sheet bar crops, ordinary	16.00 to 16.50
Heavy breakable cast	11.00 to 11.50
No. 2 railroad wrought	14.50 to 15.00
Hvy. steel axle turnings	12.50 to 13.00
Machine shop turnings	10.00 to 10.50
Acid Open-Hearth Grades:	
Railr. knuckles and couplers	18.00 to 19.00
Railr. coil and leaf springs	18.00 to 19.00
Rolled steel wheels	18.00 to 19.00
Low phos. billet and bloom ends	19.50 to 20.00
Low phos. mill plates	17.50 to 18.50
Low phos. light grades	17.50 to 18.50
Low phos. sheet bar crops	18.50 to 19.50
Heavy steel axle turnings	12.50 to 13.00
Electric Furnace Grades:	
Low phos. punchings	17.50 to 18.00
Heavy steel axle turnings	12.50 to 13.00
Blast Furnace Grades:	
Short shoveling steel turnings	10.00 to 10.50
Short mixed borings and turnings	10.00 to 10.50
Cast iron borings	10.00 to 10.50
Rolling Mill Grades:	
Steel car axles	21.50 to 22.50
Cupola Grades:	
No. 1 cast	14.00 to 14.50
Rails 3 ft. and under	17.00 to 17.50

Warehouse Prices, f.o.b. Pittsburgh

	*Base per Lb.
Plates	3.00c.
Structural shapes	3.00c.
Soft steel bars and small shapes	2.90c.
Reinforcing steel bars	2.90c.
Cold-finished and screw stock—	
Rounds and hexagons	3.60c.
Squares and flats	4.10c.
Bands	3.25c.
Hoops	4.25c.
Black sheets (No. 24), 25 or more bundles	3.60c.
Galv. sheets (No. 24), 25 or more bundles	4.25c.
Light plates, blue annealed (No. 10), 1 to 24 plates	3.20c.
Blue annealed sheets (No. 13)	3.25c.
Galv. corrug. sheets (No. 28), per square	4.13c.
Spikes, large	3.40c.
Small	3.80c. to 5.25c.
Boat	3.80c.
Track bolts, all sizes, per 100 count,	60 per cent off list
Machine bolts, 100 count,	60 per cent off list
Carriage bolts, 100 count,	60 per cent off list
Nuts, all styles, 100 count,	60 per cent off list
Large rivets, base per 100 lb.	$3.50
Wire, black, soft ann'l'd, base per 100 lb.	$2.75 to 2.85
Wire, galv. soft, base per 100 lb.	3.20 to 3.30
Common wire nails, per keg.	2.60 to 2.75
Cement coated nails, per keg	2.65 to 2.80

*On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applies to orders of 400 to 3999 lb.

To Make Krupp Products

ESSEN, GERMANY, May 12.—The Krupp interests are understood to have reached an agreement with a Canadian steel company to produce "Widia" metal and "Nirosta" stainless steel.

Semi-Finished Steel, Raw Materials, Bolts and Rivets

Mill Prices of Semi-Finished Steel

Billets and Blooms

	Per Gross Ton
Rerolling, 4-in. and under 10-in., Pittsburgh	$31.00 to $32.00
Rerolling, 4-in. and under 10-in., Youngstown	31.00 to 32.00
Rerolling, 4-in. and under 10-in., Cleveland	31.00 to 32.00
Rerolling, 4-in. and under 10-in., Chicago	34.00
Forging quality, Pittsburgh	37.00

Sheet Bars

(Open Hearth or Bessemer)

	Per Gross Ton
Pittsburgh	$31.00 to $32.00
Youngstown	31.00 to 32.00
Cleveland	31.00 to 32.00

Slabs

(8 in. x 2 in. and under 10 in. x 10 in.)

	Per Gross Ton
Pittsburgh	$31.00 to $32.00
Youngstown	31.00 to 32.00
Cleveland	31.00 to 32.00

Skelp

(F.o.b. Pittsburgh or Youngstown)

	Per Lb.
Grooved	1.70c. to 1.80c.
Universal	1.70c. to 1.80c.
Sheared	1.70c. to 1.80c.

Wire Rods

(Common soft, base)

	Per Gross Ton
Pittsburgh	$36.00
Cleveland	36.00
Chicago	37.00

Prices of Raw Material

Ores

Lake Superior Ores, Delivered Lower Lake Ports

	Per Gross Ton
Old range Bessemer, 51.50% iron	$4.80
Old range non-Bessemer, 51.50% iron	4.65
Mesabi Bessemer, 51.50% iron	4.65
Mesabi non-Bessemer, 51.50% iron	4.50
High phosphorus, 51.50% iron	4.40

Foreign Ore, c.i.f. Philadelphia or Baltimore

	Per Unit
Iron ore, low phos., copper free, 55 to 58% iron in dry Spanish or Algeria	12.00c.
Iron ore, low phos., Swedish, average 68% iron	12.00c.
Iron ore, basic Swedish, average 65% iron	10.00c.
Manganese ore, washed 52% manganese, from the Caucasus	30.00c.
Manganese ore, Brazilian, African or Indian, basic 50%	30.00c.
Tungsten ore, high grade, per unit, in 60% concentrates	$14.00 to $16.50

	Per Gross Ton
Chrome ore, 45 to 50% Cr_2O_3, crude, c.i.f. Atlantic seaboard	$22.00 to $24.00

	Per Lb.
Molybdenum ore, 85% concentrates of MoS_2, delivered	50c. to 55c.

Coke

	Per Net Ton
Furnace, f.o.b. Connellsville prompt	$2.50
Foundry, f.o.b. Connellsville prompt	$3.25 to 4.75
Foundry, by-products, Ch'go ovens,	8.00
Foundry, by-products, New England, del'd	11.00
Foundry, by-product, Newark or Jersey City, delivered	9.00 to 9.40
Foundry, by-product, Phila.	9.00
Foundry, Birmingham	5.00
Foundry, by-product, St. Louis, f.o.b. ovens	8.00
Foundry by-prod., del'd St. Louis	9.00

Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	$1.25 to $1.75
Mine run coking coal, f.o.b. W. Pa. mines	1.50 to 1.75
Gas coal, ¾-in. f.o.b. Pa. mines	1.90 to 2.00
Mine run gas coal, f.o.b. Pa. mines	1.65 to 1.75
Steam slack, f.o.b. W. Pa. mines	90c. to 1.10
Gas slack, f.o.b. W. Pa. mines	1.00 to 1.25

Ferromanganese

	Per Gross Ton
Domestic, 80%, seaboard	$94.00 to $99.00
Foreign, 80%, Atlantic or Gulf port, duty paid	94.00 to 99.00

Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%	$31.00 to $34.00
Domestic, 16 to 19%	29.00 to 32.00

Electric Ferrosilicon

	Per Gross Ton Delivered
50%	$83.50
75%	130.00

Per Gross Ton Furnace		*Per Gross Ton Furnace*	
10%	$35.00	12%	$39.00
11%	37.00	14 to 16%	39.00

Bessemer Ferrosilicon

F.o.b. Jackson County, Ohio, Furnace

Per Gross Ton		*Per Gross Ton*	
10%	$30.00	13%	$34.00
11%	32.00	14%	36.00
12%	34.00	15%	39.00

Silvery Iron

F.o.b. Jackson County, Ohio, Furnace

Per Gross Ton		*Per Gross Ton*	
6%	$22.00	11%	$27.00
7%	22.50	12%	29.00
8%	23.00	13%	31.00
9%	24.00	14%	33.00
10%	25.00	15%	36.00

Other Ferroalloys

Ferrotungsten, per lb. contained metal del'd	$1.30 to $1.40
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads	11.00c.
Ferrovanadium, per lb. contained vanadium, f.o.b. furnace	$3.15 to $3.65
Ferrocarbontitanium, 15 to 18%, per net ton, f.o.b. furnace, in carloads	$160.00
Ferrophosphorus, electric or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per gross ton	$91.00
Ferrophosphorus, electric 24%, f.o.b. Anniston, Ala., per gross ton	$122.50

Fluxes and Refractories

Fluorspar

	Per Net Ton
Domestic, 85% and over calcium fluoride, not over 5% silicon, gravel, f.o.b. Illinois and Kentucky mines	$18.00
No. 2 lump, Illinois and Kentucky mines	20.00
Foreign, 85% calcium fluoride, not over 5% silica, c.i.f. Atlantic port, duty paid	$18.00 to 18.50
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silica, f.o.b. Illinois and Kentucky mines	32.50

Fire Clay Brick

Per 1000 f.o.b. Works

	High-Heat Duty Brick	Intermediate Heavy Duty Brick
Pennsylvania	$43.00 to $46.00	$35.00 to $38.00
Maryland	43.00 to 46.00	35.00 to 38.00
New Jersey	50.00 to 65.00	.....
Ohio	43.00 to 46.00	35.00 to 38.00
Kentucky	43.00 to 46.00	35.00 to 38.00
Missouri	43.00 to 46.00	35.00 to 38.00
Illinois	43.00 to 46.00	35.00 to 38.00
Grond fire clay, per ton	7.00	

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$43.00
Chicago	52.00
Birmingham	50.00
Silica clay, per ton	$8.50 to 10.00

Magnesite Brick

	Per Net Ton
Standard sizes, f.o.b. Baltimore and Chester, Pa.	$65.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	40.00
Standard size	45.00

Chrome Brick

	Per Net Ton
Standard size	$45.00

Mill Prices of Bolts, Nuts, Rivets and Set Screws

Bolts and Nuts

Per 100 Pieces

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
†Machine bolts	73
†Carriage bolts	73
Lag bolts	73
Plow bolts, Nos. 1, 2, 3 and 7 heads	73
Hot-pressed nuts, blank or tapped, square	73
Hot-pressed nuts, blank or tapped, hexagons	73
C.p.c. and t. square or hex. nuts, blank or tapped	73
Washers*	7.00c. to 6.75c. per lb. off list

*F.o.b. Chicago, New York and Pittsburgh.

†Bolts with rolled thread up to and including ⅝ in. x 6 in. take 10 per cent lower list prices.

Bolts and Nuts

	Per Cent Off List
Semi-finished hexagon nuts	73
Semi-finished hexagon castellated nuts, S.A.E.	73
Stove bolts in packages, P'gh.	80, 10, 10 and 5
Stove bolts in packages, Chicago.	80, 10, 10 and 5
Stove bolts in packages, Cleveland.	80, 10, 10 and 5
Stove bolts in bulk, P'gh.	80, 10, 10, 5 and 2½
Stove bolts in bulk, Chicago.	80, 10, 10, 5 and 2½
Stove bolts in bulk, Cleveland.	80, 10, 10, 5 and 2½
Tire bolts	60, 10 and 10

Discounts of 73 per cent off on bolts and nuts applied on carload business.

Large Rivets

(½-in. and larger)

	Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland	$2.90
F.o.b. Chicago	3.00

Small Rivets

(7/16-in. and smaller)

	Per Cent Off List
F.o.b. Pittsburgh	70, 10 and 5
F.o.b. Cleveland	70, 10 and 5
F.o.b. Chicago	70, 10 and 5

Cap and Set Screws

(Freight allowed up to but not exceeding 50c. per 100 lb. on lots of 200 lb. or more)

	Per Cent Off List
Milled cap screws	80, 10 and 5
Milled standard set screws, case hardened	80 and 5
Milled headless set screws, cut thread	75 and 10
Upset hex. head cap screws, U.S.S. thread	85 and 10
Upset hex. cap screws, S.A.E. thread	85 and 10
Upset set screws	80, 10 and 5
Milled studs	70

CHICAGO

Trend of Steel Consumption Downward, with Ingot Rate Now at 85 Per Cent

CHICAGO, May 27.—Changes in this week's iron and steel market, while not of great moment, definitely point to lower consumption, not an unusual situation at this time of the year. Some steel users, especially the smaller ones, are exercising greater caution in making commitments, while in other lines, such as car building and in rails, the use of steel is gradually diminishing.

Changes are reflected in ingot output, which does not stand above 85 per cent of capacity. No. 2 furnace at Gary has been banked. The leading producer is now operating 17 of 27 stacks, and for the district as a whole active steel mill furnaces total 25 of 36.

Deliveries of finished steel are on the point of improving, as evidenced by the willingness of mills to accept small and mixed orders which necessitate frequent roll changes if shipping instructions are to be met.

New sales are the smallest of any week this month. This, however, may not give a true picture of the market, as close range buying is resulting in large sales at or near the first of each month. There are some in the trade who feel that the recent change in freight rates is having a temporary effect of deadening the market.

About 8000 tons of the 20,000 tons of tank plates, which has been in the market for many weeks, has been placed. A small part of this tonnage has reached Chicago mills, while the bulk has been scattered among producers east of here. The pipe maker at Milwaukee is again in the market to arrange shipping schedules for plates which are to apply against recent business.

The scrap market in the West is hazy. Consumption is large in the heavy tonnage grades, whereas demand for specialties is unusually spotty. Producers of scrap are holding back, not being satisfied with current prices, and there is evidence that brokers are working out of their positions. These factors might tend to strengthen prices were it not that it is a buyers' market, with liberal supplies coming from railroads and well-filled yards.

Coke. — Shipments of by-product foundry coke are steady, and the usual quotation on spot business is $8 a ton, f.o.b. local ovens.

Pig Iron.—The Western pig iron market, as gaged by shipments, is following closely the pace set earlier in the month. Total deliveries in May will exceed by a small margin the aggregate in April, after taking into account the extra day in the current month. The base price of Northern iron is $19 a ton, furnace, on the general run of business, which for the most part is in small lots. Real tests in tonnage lots are lacking.

A cargo of 2000 tons of Lake Erie iron has been unloaded at Milwaukee for delivery to one consumer. Chicago docks are said to hold about 4000 tons of boat iron, which is being offered at concessions of $1 or more from the Chicago furnace price. No. 3 Iroquois furnace has been lighted. All merchant stacks are in use.

Prices per gross ton at Chicago:

N'th'n No. 2 fdy., sil. 1.75 to 2.25	$19.00
N'th'n No. 1 fdy., sil. 2.25 to 2.75	19.50
Malleable, not over 2.25 sil.	19.00
High phosphorus	19.00
Lake Super. charc'l, sil. 1.50	27.04
S'th'n No. 2 fdy.	$18.20 to 19.01
Low phos., sil. 1 to 2, copper free	29.50
Silvery, sil. 8 per cent	27.79
Bess. ferrosilicon, 14-15 per cent	46.29

Prices are delivered consumers' yards except on Northern foundry, high phosphorus and malleable, which are f.o.b. local furnace, not including an average switching charge of 61c. per gross ton.

Plates.—The local plate market, though less active than a week ago, remains an important factor in steel mill operations. Specifications from car builders, at 5000 tons, are smaller than mills were accustomed to receive earlier in the year, but now releases of this character are very satisfactory from the viewpoint of arranging rolling schedules.

The Illinois Central has again postponed the date when it plans to award 2300 cars and other equipment, which will take over 25,000 tons of steel. It is thought here that the 250 tank cars on inquiry for the Gulf Refining Co. will be purchased at an early date. Among the more attractive inquiries this week is one for 2000 tons for reclamation work in Oregon. A user of large tanks in Tennessee is about to order 900 tons of plates.

Pipe.—The outlook for business from oil and gas producing sections of the country is favorable. The Sinclair Pipe Line Co. has ordered 4000 tons of pipe from the Youngstown Sheet & Tube Co. The National Supply Co. has taken two large contracts for line pipe and supplies from the Missouri-Kansas Pipe Line Co. and the Albuquerque Natural Gas Co.

The Southwestern Natural Gas Co. has awarded to the A. O. Smith Corporation 115 miles of 16 and 18-in. gas pipe for delivery to Quinton, Okla., and vicinity. This will take 18,000 tons of plates.

The Missouri-Kansas Pipe Line Co. has released for immediate construction gas pipe line 1250 miles long, running from the Panhandle of Texas to Indiana, connecting with the company's Kentucky pipe line near Evansville, Ind.

Structural Material.—Keen competition and low prices are outstanding factors in this market. Awards total less than 1500 tons, a marked drop from the average of recent weeks. Fresh inquiries, at 8000 tons, give some promise. About 25 per cent of the structural steel needed for the expansion program of the Illinois Steel Co. has been fabricated. This work calls for 60,000 tons of steel.

Bars.—The bar market in the Middle West is steady. Mild steel bars are holding at 1.85c. a lb., Chicago, and there has been little deviation from 1.90c. on iron bars. Rail steel bars are holding at 1.80c., which is only $1 a ton below mild steel bars, whereas there is usually a $2 spread.

Activity by builders of low-priced automobiles is reflected in increased specifications from parts makers and forgers. Road machinery builders are operating with large backlogs, and there appears to be a halt in the downward revision of production schedules in the agricultural implement trade.

Mild steel bars may be had in 10 to 30 days. Rolling schedules are very flexible, and many shipments of small size are being made on short notice. Specifications for alloy steel bars are spotty, and the aggregate tonnage is smaller than that of a week ago. Operations remain at about 70 per cent of capacity. The iron bar market is quiet. Backlogs are practically negligible and spot buying is of little importance.

New buying of rail steel bars is at extremely close range, but the total tonnage in new business is close to shipments, which represent about 70 per cent of mill capacity. Barn equipment manufacturers are finding

Warehouse Prices, f.o.b. Chicago

	Base per Lb.
Plates and structural shapes	3.10c.
Soft steel bars	3.00c.
Reinforc'g bars, billet steel—	
Under 5 tons	2.85c.
5 tons to 30 tons	2.45c.
30 tons and over	2.00c.
Rail steel reinforcement	1.75c.
Cold-fin. steel bars and shafting—	
Rounds and hexagons	3.35c.
Flats and squares	3.85c.
Bands (7/8 in. in Nos. 10 and 12 gages)	3.20c.
Hoops (No. 14 gage and lighter)	3.75c.
Black sheets (No. 24)	4.05c.
Galv. sheets (No. 24)	4.60c.
Blue ann'l'd sheets (No. 10)	3.35c.
Spikes (7/8 in. and larger)	3.55c.
Track bolts	4.55c.
Rivets, structural	4.00c.
Rivets, boiler	4.00c.

	Per Cent Off List
Machine bolts	60 and 10
Carriage bolts	60 and 10
Coach or lag screws	60 and 10
Hot-pressed nuts, sq., tap. or blank.	60 and 10
Hot-pressed nuts, hex., tap. or blank.	60 and 10

No. 8 black ann'l'd wire, per 100 lb.	$3.45
Com. wire nails, base per keg.	$2.75 to 2.85
Cement c't'd nails, base per keg	2.75 to 2.85

business more brisk and are entering larger specifications.

Wire Products.—The local wire market is doing no more than holding its own against odds that appear to foretell lower consumption. Backlogs are light, and new buying from practically all sources is dull. Use of wire and wire products by the manufacturing trade is steady, but lighter than at the beginning of the month. Demand from jobbers has receded to a lower level, but the tonnage being distributed by dealers is holding remarkably steady in view of the lateness of the season. Use of wire rope is seasonably small because of curtailed use in oil well drilling and the comparative dullness of the building industry in many parts of the country.

In the past several weeks there has been a substantial increase in the footage of electrical wire ordered. However, interest at the moment is waning as indicated by a sharp drop in inquiries. The radio industry remains quiet.

Cold weather is retarding crops in some parts of the country, while in other sections the complaints are either that rainfall is excessive or that it has been insufficient.

Rails and Track Supplies.—Upward of 5000 tons of standard-section rails have been released by an Eastern railroad, which for several months has neglected to order out tonnages against a contract placed last fall. This is taken by local producers to foretell releases of additional tonnages and also a reflection that this railroad has caught up with its track-laying program and that it has exhausted the rails it had on hand. Several weeks ago it appeared that Western rail mills would curtail operations below 80 per cent of capacity, which is the current rate. However, releases are coming in more freely, and there is indication now that shipments will hold steady through June. Sellers expect inquiries for secondary rail needs to develop late in June. The Norfolk & Western is inquiring for 40,000 tons.

Prices f.o.b. mill, per gross ton: Standard section open-hearth and Bess. rails, $43; light rails, rolled from billets, $36. *Per lb.:* Standard railroad spikes, 2.80c.; track bolts with square nuts, 3.80c.; steel tie plates, 2.07½c. to 2.15c.; angle bars, 2.75c.

Cold-Rolled Strip.—The new freight rate from Cleveland to Chicago is 28c. a 100 lb. Base prices at Cleveland are 2.45c. to 2.55c. a lb. and quotations delivered Chicago are 2.73c. to 2.83c.

Cast Iron Pipe.—The freight rate from Birmingham to Chicago has been reduced from $8.20 a ton to $8. Delivered quotations on water pipe, 6 in. and over, are now $45 to $46 a ton. Lettings by municipalities have been very light this week. On the other hand, there is a better run of orders from contractors, and some unexpected public utility business has come into the market.

St. Paris, Ohio, is in the market for 30,000 ft. of 4 to 8-in. pipe, and St. Louis will buy 20,000 ft. of 6-in. Class B pipe. Getz Brothers, Baltic, Ohio, have been awarded a general contract by Killbuck, Ohio. Midland, Mich., has awarded 300 tons of 6 to 10-in. pipe to an unnamed bidder.

Trend in West appears to be toward lower consumption of steel.

* * *

Ingot rate in Chicago district recedes to 85 per cent of capacity.

* * *

Recent freight rate changes believed to have had temporary deadening effect on market.

* * *

Norfolk & Western Railroad inquires for 40,000 tons of rails.

* * *

Scrap market generally a buyers' affair, with prices lower.

Prices per net ton, deliv'd Chicago: Water pipe, 6-in. and over, $45 to $46; 4-in., $48 to $49; Class A and gas pipe, $3 extra.

Warehouse Business.—Volume of transactions and the tonnage moving is little changed from a week ago. Prices for cold-finished steel bars have been reduced 25c. a 100 lb.

Bolts, Nuts and Rivets.—Specifications for these commodities are lighter than a week ago. Sellers are preparing third quarter contracts, which will be submitted at the recently established price levels.

Sheets.—Hot mill operations in this district have dropped five to 10 points to an average that is not far above 60 per cent of capacity. Producers are practically without backlogs. New buying early last week was light. In recent days, however, fill-in orders have been more numerous, and the general tone of the market appears to have improved somewhat.

Base prices per lb., deliv'd from mill in Chicago: No. 24 black sheets, 2.70c.; No. 24 galv., 3.35c. to 3.45c.; No. 10 blue ann'l'd, 2.15c. to 2.25c. Deliv'd prices at other Western points are equal to the freight from Gary, plus the mill prices, which are 5c. per 100 lb. lower than Chicago delivered prices.

Reinforcing Bars.—This market has struck more or less of a dead level, which is neither up to seasonal expectations nor is it so low that dealers can register a great deal of complaint. Outstanding in this week's business is an award of about 600 tons for the footings of the outer bridge at Chicago. This is the forerunner of extensive developments along the lake front.

Chicago's traction ordinance has now passed all barriers except a popular vote, which will be taken July 1. This plan calls for subway construction which will draw heavily against the reinforcing bar market. Estimating departments are well engaged, but this is not a good measure of the market because so many projects fall by the wayside. Prices are moderately steady except on tonnages above 500 tons each.

Old Material.—Prices continue to give ground, as dealers press for sales and users withhold from the market. Mills are being urged to take heavy melting steel at $12.75 a gross ton, delivered, but they have steadfastly refused to make additional commitments.

Railroad offerings are large and shipments from this source are coming out frequently. Lower steel mill operations call for smaller use of the heavy tonnage grades, and, not only are prices weaker, but acceptances are being curtailed and inspections are being drawn tighter. Small producers of scrap are dissatisfied with prices offered and some of them are allowing production to accumulate in the expectation that they can make better sales if they wait.

Cast iron borings are off 25c. to $9 a ton, delivered. Dealers are paying $8.50 a ton or less for this grade.

The Milwaukee road is offering 7000 tons and the Oakland Motor Car Company will sell 27 cars.

Prices deliv'd Chicago district consumers.

Per Gross Ton	
Basic Open-Hearth Grades:	
Heavy melting steel	$12.25 to $12.75
Shoveling steel	12.25 to 12.75
Frogs, switches and guards, cut apart, and misc. rails	13.00 to 13.50
Hydraul. compressed sheets	11.00 to 11.50
Drop forge flashings	9.50 to 10.00
No. 1 busheling	10.00 to 10.50
Forg'd cast and r'l'd steel carwheels	15.50 to 16.00
Railroad tires, charg. box size	15.50 to 16.00
Railroad leaf springs cut apart	16.00 to 16.50
Acid Open-Hearth Grades:	
Steel couplers and knuckles	14.00 to 14.50
Coil springs	16.00 to 16.50
Electric Furnace Grades:	
Axle turnings	11.50 to 12.00
Low phos. punchings	13.50 to 14.00
Low phos. plates, 12 in. and under	13.50 to 14.00
Blast Furnace Grades:	
Axle turnings	9.50 to 10.00
Cast iron borings	8.50 to 9.00
Short shoveling turnings	8.50 to 9.00
Machine shop turnings	6.75 to 7.25
Rolling Mill Grades:	
Iron rails	13.50 to 14.00
Rerolling rails	14.75 to 15.25
Cupola Grades:	
Steel rails, less than 3 ft.	14.50 to 15.00
Steel rails, less than 2 ft.	15.25 to 15.75
Angle bars, steel	13.50 to 14.00
Cast iron carwheels	13.75 to 14.25
Malleable Grades:	
Railroad	15.50 to 16.00
Agricultural	13.00 to 13.50
Miscellaneous:	
*Relaying rails, 56 to 60 lb.	23.00 to 25.00
*Relaying rails, 65 lb. and heav.	26.00 to 31.00
Per Net Ton	
Rolling Mill Grades:	
Iron angle and splice bars	13.50 to 14.00
Iron arch bars and transoms	15.00 to 15.50
Iron car axles	25.00 to 25.50
Steel car axles	15.50 to 16.00
No. 1 railroad wrought	11.00 to 11.50
No. 2 railroad wrought	11.00 to 11.50
No. 1 busheling	9.00 to 9.50
No. 2 busheling	7.25 to 7.75
Locomotive tires, smooth	14.50 to 15.00
Pipes and flues	8.00 to 8.50
Cupola Grades:	
No. 1 machinery cast	12.75 to 13.25
No. 1 railroad cast	11.25 to 11.75
No. 1 agricultural cast	9.50 to 10.00
Stove plate	9.50 to 10.00
Grate bars	8.50 to 9.00
Brake shoes	8.50 to 9.00

*Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.

NEW YORK

Pig Iron Demand Steady But Not Gaining—Steel Plates Still Weak

NEW YORK, May 27.—Pig iron demand is in keeping with the slow rate of foundry operations. Sales, at 8000 tons, are equal to those of the preceding week. Unclosed business before the trade is light. The Burnham Boiler Corporation, Irvington, N. Y., is in the market for a small tonnage of No. 2 plain and No. 2X for delivery at Lancaster, Pa., and the State of New Jersey wants 100 tons of No. 2X for the foundry of the reformatory at Rahway. A tentative inquiry for 1200 tons is pending. The Essex Foundry, Newark, N. J., has closed for 1000 tons of foundry iron, and the Central Foundry Co., New York, has bought a tonnage for Dundalk, Md. The price situation shows no significant change. The decline in steel demand has made steel company furnaces more aggressive sellers of pig iron.

Prices per gross ton, delivered New York district:

Buffalo No. 2 fdy., sil. 1.75 to 2.25	$20.91 to $21.41
*Buff. No. 2, del'd east. N. J.	19.28 to 19.78
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	19.39 to 21.02
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	19.89 to 21.52

Freight rates: $4.91 from Buffalo, $1.39 to $2.52 from eastern Pennsylvania.
*Prices delivered to New Jersey cities having rate of $3.28 a ton from Buffalo.

Finished Steel.—The only product in which fresh price weakness has appeared is plates from Eastern mills. While quotations are nominally 1.80c. and 1.85c., Coatesville, Pa., with these prices being obtained on most of the business, some of the more attractive orders have gone at 1.75c., with an occasional 1.70c. reported. Cold-rolled strip is now quite generally quoted at 2.45c., Pittsburgh or Cleveland. Otherwise, recent prices seem to be holding fairly well.

Volume of business has not gained, however. Increases in some lines, notably pipe and reinforcing bars, are offset by smaller orders in other lines, sheets in particular. Belief is growing in sales offices, however, that the worst is over with respect to prices, and that business during the next few months will be at a fairly steady rate, though gains of importance are not expected until late summer or early fall. Railroad equipment builders look for heavy buying in the fall, and are reconciled to the belief that there will be no large business done during the summer. Pipe, structural steel and reinforcing bars are the lines in which improvement probably will lead. In fact, pipe and reinforcing bar business is already quite satisfactory.

Warehouse Business.—Buying has increased slightly in the past week, and most jobbers expect May to be a better month than April. Prices on galvanized sheets are slightly firmer, and concessions below 4.25c. a lb., base, are uncommon. Demand for structural steel is still limited to smaller lots than usual at this season.

Cast Iron Pipe.—Prices of bell and spigot pipe are being maintained, despite the small tonnage of business in the market at present. On June 2, Providence, R. I., opens bids on 700 tons of 12-in. pipe and Bloomfield, N. J., on 360 tons of 16-in. pipe. Northern foundries are operating at about 75 per cent and better, but a substantial part of the tonnage is in small lots for prompt shipment.

Prices per net ton deliv'd New York: Water pipe, 6-in. and larger, $39.90 to $40.90; 4-in. and 5-in., $42.90 to $43.90; 3-in., $49.90 to $50.90. Class A and gas pipe, $3 extra.

Coke.—The furnace grade still lacks firmness, quotations ranging from $2.40 to $2.60 a net ton, Connellsville. Occasionally less than $2.40 is quoted on a small distress tonnage. Foundry coke prices are:

Special brands of beehive foundry coke, $4.85 a net ton, ovens, or $8.56 delivered to northern New Jersey, Jersey City and Newark, and $9.44 to New York and Brooklyn; by-product foundry coke, $9 to $9.40, Newark or Jersey City; $10.06, New York or Brooklyn.

Reinforcing Bars.—Public works account for a large part of current activity. Of the week's awards reported in this territory, totaling 4010 tons, all but 700 tons was for public undertakings. Unreported lettings—less than 100 tons each—are numerous and make up a sizable tonnage in the aggregate. Price competition is still very sharp on large jobs, but on smaller work for mill shipment 1.85c., base Pittsburgh, is being obtained in some cases.

Concrete bars in 40, 50 and 60-ft. lengths for mill shipment are quoted at 1.75c. to 1.85c. a lb., base Pittsburgh. Warehouse prices range from 2.40c. a lb., f.o.b. cars, New York, for carloads or larger lots to 3.25c. for the smallest tonnages.

Old Material.—Consumer buying continues at a minimum, and, with most grades being freely offered by dealers and other holders of scrap, brokers have further reduced buying prices except on No. 1, heavy melting steel. This grade is still being bought at $13 a ton, delivered eastern Pennsylvania, or $9.50, New York, and for barge shipment to consumers in Buffalo, $10.50 is offered, f.o.b. barge. A large steel company which prepares some of its own scrap has received such a large supply that it has drastically curtailed purchases.

Dealers' buying prices per gross ton, f.o.b. New York:

No. 1 heavy melting steel	$9.50 to $10.50
Heavy melting steel (yard)	6.50 to 7.00
No. 1 hvy. breakable cast.	8.50
Stove plate (steel works)	6.50 to 7.00
Locomotive grate bars	7.00 to 7.50
Machine shop turnings	5.50 to 6.00
Short shoveling turnings	5.50 to 6.00
Cast borings (blast fur. or steel works)	6.50
Mixed borings and turnings	5.00
Steel car axles	17.00
Iron car axles	19.50 to 20.00
Iron and steel pipe (1 in. dia., not under 2 ft. long)	8.75
Forge fire	8.00
No. 1 railroad wrought	10.00 to 10.50
No. 1 yard wrought, long	9.00 to 9.50
Rails for rolling	10.00 to 10.50
Stove plate (foundry)	8.50
Malleable cast (railroad)	10.50 to 11.00
Cast borings (chemical)	9.00

Prices per gross ton, deliv'd local foundries:

No. 1 machry. cast	$15.00
No. 1 hvy. cast (columns, bldg. materials, etc.); cupola size	13.00
No. 2 cast (radiators, cast boilers, etc.)	12.50

Warehouse Prices, f.o.b. New York

	Base per Lb.
Plates and structural shapes	3.30c.
Soft steel bars, small shapes	3.25c.
Iron bars	3.24c.
Iron bars, Swed. charcoal	7.00c. to 7.25c.
Cold-fin. shafting and screw stock—	
Rounds and hexagons	3.40c.
Flats and squares	3.90c.
Cold-roll. strip, soft and quarter hard	4.95c.
Hoops	4.25c.
Bands	3.75c.
Blue ann'l'd sheets (No. 10)	3.60c.
Black sheets (No. 24*)	3.80c. to 4.00c.
Galvanized sheets (No. 24*)	4.25c. to 4.50c.
Long terne sheets (No. 24)	5.80c.
Standard tool steel	12.00c.
Wire, black annealed	4.50c.
Wire, galv. annealed	5.15c.
Tire steel, ½ x ½ in. and larger	3.40c.
Smooth finish, 1 to 2½ x ¼ in. and larger	3.75c.
Open-hearth spring steel, bases,	4.50c. to 7.00c.

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

	Per Cent Off List
Machine bolts, cut thread:	
¾ x 6 in. and smaller	60
1 x 30 in. and smaller	50 to 50 and 10
Carriage bolts, cut thread:	
½ x 6 in. and smaller	60
¾ x 20 in. and smaller	50 to 50 and 10

	Per 100 Ft.
Boiler Tubes—	
Lap welded, 2-in.	$19.00
Seamless steel, 2-in.	20.25
Charcoal iron, 2-in.	26.25
Charcoal iron, 4-in.	67.00

Tin Plate (14 x 20 in.)

	Prime	Seconds
Coke, 100 lb. base box	$6.45	$6.20
Charcoal, per Box—	A	AAA
IC	$9.70	$12.10
IX	12.00	14.25
IXX	13.90	16.00

Chicago Rate to Coast Reduced to 62c.

WASHINGTON, May 27.—Rates on iron and steel products from the Chicago district to the Pacific Coast by rail to New Orleans and by the Redwood Steamship Line from the latter point were reduced 4c. a 100 lb., to 62c. from 66c., effective May 26. The new rates became operative when the Interstate Commerce Commission declined to suspend the tariff filed by the Illinois Central and other carriers. The principal interest in the reduced rates lies in the fact that the Chicago-Pacific Coast level has now been cut to a parity with the Pittsburgh-Pacific Coast rates.

PHILADELPHIA

Mills Operate Part Time—Sheet Prices Decline

PHILADELPHIA, May 27.—Concessions in the price of blue annealed sheets have become so prevalent that 2.15c. a lb., Pittsburgh, for No. 13 gage is no longer representative of the market, which ranges from 2c., Pittsburgh, for automobile manufacturers to a maximum of 2.10c., Pittsburgh, for smaller consumers. While heavy plates are still quoted at 1.80c., Coatesville, Pa., on ordinary business, combination sales of plates and shapes have brought concessions in the plate price of $1 to $2 a ton.

Steel mill operations in this district show further curtailment, and suspension for part or all of a week has been adopted by certain mills because of the lack of orders. One mill will suspend operation for the week of June 2, and another mill has recently been closing for the week-end on Friday, resuming operation the following Tuesday morning.

Shipbuilding still promises substantial tonnages of plates and shapes, and the formal award of two 30,000-ton vessels by the United States Lines, Inc., to the New York Shipbuilding Co. brings the purchase of about 30,000 tons of plates and shapes somewhat nearer. Ships still to be awarded include two for the Quaker City Line, two for the Eastern Steamship Co. and four for the Orient Steamship Co. Railroad buying is still small, except for an inquiry from the Norfolk & Western Railroad for 40,000 tons of rails.

Pig Iron.—Eastern Pennsylvania producers are quoting foundry iron at $19 to $19.50 a ton, furnace, but most of the current buying, even of small lots, is at the minimum price. Southern iron is still moving to consumers in this district at $12.50, furnace, or $17.75, at dock, Philadelphia. Demand for low phosphorus pig iron is small, and a local furnace, which has been banked awaiting development of demand in this grade, has had no occasion to resume production, still having sufficient tonnage in stock.

Prices per gross ton at Philadelphia:

East. Pa. No. 2, 1.75 to 2.25 sil.	$19.76 to $20.26
East. Pa. No. 2X, 2.25 to 2.75 sil.	20.26 to 20.76
East. Pa. No. 1X	20.76 to 21.26
Basic (del'd east. Pa.)	18.75 to 19.00
Malleable	21.25
Stand. low phos. (f.o.b. east. Pa. furnace)	24.00
Cop. b'r'g low phos. (f.o.b. furnace)	23.00 to 24.00
Va. No. 2 plain, 1.75 to 2.25 sil.	22.29
Va. No. 2X, 2.25 to 2.75 sil.	22.79

Prices, except as specified otherwise, are deliv'd Philadelphia. Freight rates: 76c. to $1.64 from eastern Pennsylvania furnaces; $4.54 from Virginia furnaces.

Bars.—Although bar orders are small, they are sufficient in number to provide a fair total tonnage, and the price is being maintained at 1.75c. a lb., Pittsburgh, or 2.04c., delivered Philadelphia.

Reinforcing Bars.—A school administration building for the Philadelphia school district calls for 200 tons of reinforcing bars. About 300 tons of bars in a county jail at Reading, Pa., have been awarded to the McClintic-Marshall Co.

Shapes.—Demand is fair, but not much in advance of that of last month. Mills are seeking tonnage, and buyers are usually able to obtain prompt delivery of almost any specification. Prices range from 1.70c. to 1.75c., f.o.b. nearest mill to consumer, or 1.76c. to 1.81c., delivered Philadelphia. Projects requiring fabricated steel are increasing, but tonnages are small. About the largest current inquiry is for 2500 tons in a school administration building in Philadelphia.

Plates.—Buying is limited to small lots, on which 1.80c., Coatesville, or 1.90½c., Philadelphia, applies. When quotations are made on orders combining plates and shapes, plates are usually shaded $1 to $2 a ton to a range of 1.70c. to 1.75c., Coatesville. No purchases have been made against the contract for two 30,000-ton vessels formally awarded to the New York Shipbuilding Co. The Pusey & Jones Co., Wilmington, Del., building a private yacht for a Detroit motor car manufacturer, has bought about 200 tons of plates from an eastern Pennsylvania mill.

Sheets.—Mills are in need of tonnage and show willingness to grant substantial concessions to obtain orders. In fact, blue annealed sheets, No. 13 gage, have settled to a range of 2c. a lb., Pittsburgh, or 2.29c., Philadelphia, for automobile manufacturers, to 2.05c. and 2.10c., Pittsburgh, or 2.34c. and 2.39c., Philadelphia, for other consumers. Blue annealed plates, No. 10 gage, range from 1.80c., Pittsburgh, or 2.09c., Philadelphia, for car builders and other preferred buyers, to 2c., Pittsburgh, or 2.29c., Philadelphia, for smaller users. Black sheets are quoted at 2.55c., Pittsburgh, or 2.84c., delivered Philadelphia, while a black sheet base of 2.45c. to 2.50c., Pittsburgh, is being used to add the extras for high-finished sheets.

Imports.—In the week ended May 24, 3635 tons of pig iron arrived at this port, of which 2852 tons was from British India and 783 tons from Norway. Steel imports consisted of 1094 tons of structural shapes from Belgium, and 206 tons from France, 36 tons of steel bars from France and 23 tons from Belgium, and 18 tons of hoops and nine tons of steel scrap from the United Kingdom.

Old Material.—No. 1 heavy melting steel has been sold in small lots, totaling close to 1000 tons, at $13 a ton, delivered Claymont, Del. A sizable tonnage of this grade has been offered at the same price to the Bethlehem, Pa., mill. The consumer at Bethlehem has bought a small tonnage of blast furnace scrap at about $8.50 a ton, delivered Bethlehem, and made a sizable contract at $9, delivered Steelton, Pa.

Prices per gross ton delivered consumers' yards, Philadelphia district:

No. 1 heavy melting steel	$13.00 to $13.50
No. 2 heavy melting steel	11.00 to 11.50
Heavy melting steel (yard)	10.25 to 10.75
No. 1 railroad wrought	15.00 to 15.50
Bundled sheets (for steel works)	9.50 to 10.00
Hydraulic compressed, new	12.00 to 12.50
Hydraulic compressed, old	10.00
Machine shop turnings (for steel works)	9.50
Heavy axle turnings (or equiv.)	11.50 to 12.00
Cast borings (for steel works and roll. mill)	10.00
Heavy breakable cast (for steel works)	12.50 to 13.00
Railroad grate bars	10.50
Stove plate (for steel works)	10.50
No. 1 low phos., hvy., 0.04% and under	20.00 to 20.50
Couplers and knuckles	19.00 to 19.50
Rolled steel wheels	18.50 to 19.00
No. 1 blast f'nace scrap	8.50 to 9.00
Wrot. iron and soft steel pipes and tubes (new specific.)	12.50
Shafting	18.00 to 18.50
Steel axles	21.00 to 21.50
No. 1 forge fire	12.00 to 12.50
Cast iron carwheels	14.50 to 15.00
No. 1 cast	14.00 to 14.50
Cast borings (for chem. plant)	13.50 to 14.00
Steel rails for rolling	15.00 to 15.50

Warehouse Prices, f.o.b. Philadelphia

	Base per Lb.
Plates, ¼-in. and heavier	2.70c.
Plates, ⅜-in.	2.90c.
Structural shapes	2.70c.
Soft steel bars, small shapes, iron bars (except bands)	2.80c.
Reinforc. steel bars, sq., twisted and deform.	2.60c. to 2.80c.
Cold-fin. steel, rounds and hex.	3.40c.
Cold-fin. steel, sq. and flats	3.90c.
Steel hoops	3.55c.
Steel bands, No. 12 to ⅛-in. inclus.	3.30c.
Spring steel	5.00c.
*Black sheets (No. 24)	3.80c.
†Galvanized sheets (No. 24)	4.25c.
Light plates, blue annealed (No. 10)	3.25c.
Blue ann'l'd sheets (No. 13)	3.40c.
Diam. pat. floor plates, ¼-in.	5.30c.
Swedish iron bars	6.60c.

*For 50 bundles or more: 10 to 49 bun., 4.10c. base; 1 to 9 bun., 4.35c. base.
†For 50 bundles or more: 10 to 49 bun., 4.95c. base; 1 to 9 bun., 5.30c. base.

New York Tunnel to Take 35,000 Tons of Cast Iron

In addition to 3100 tons of structural steel, the East River tunnel of the Houston Street subway extension, New York City, will require 35,000 tons of cast iron segments, contracts for which will be awarded to the Bethlehem Steel Corporation and the Davies & Thomas Co., the latter of Catasauqua, Pa.

CLEVELAND

Steel Business Holding at Steady Level—Prices Appear to Be Stabilized

CLEVELAND, May 27.—There has been no marked tendency either upward or downward in the demand for finished steel the past week. The volume of business in May with leading producers will show little change as compared with April. There is nothing at present to indicate much greater activity in June.

Local steel plant operations were slightly increased this week by the addition of one open-hearth furnace. Mills here are now operating at 79 per cent of ingot capacity.

Two or three Michigan automobile companies will increase production shortly, and the output of motor cars may show a slight gain in June over that of May provided the present production of cheaper cars is maintained. However, a slight curtailment has been placed in effect by a Cleveland plant making Chevrolet bodies.

Aside from the automotive industry, the building field is furnishing the bulk of the steel business in this territory. Bridge and other municipal work to be placed in Cleveland shortly will require more than 17,000 tons of structural steel.

Prices seem fairly well stabilized on products on which there have been recent reductions, although in some there is scarcely enough business to furnish a test of the market. Prices on sheet bars, billets and slabs have been reduced $1 to $2 a ton, following weakness that recently developed in these products.

Pig Iron.—Demand continues slow, with consumers limiting purchases to small lots for early needs. Sales by Cleveland interests totaled 10,000 tons during the week. May shipments will be about the same as during April. The automotive industry is taking a little more iron than last month, but this is offset by a seasonal slowing down in the demand from manufacturers of heating equipment and agricultural machinery. There is little change in operations by jobbing foundries in this territory. Some furnace stocks are increasing slightly.

Prices are unchanged at $18, Cleveland, for foundry and malleable iron for outside shipment and $18.50, furnace, for local delivery. Other Lake furnaces quote these grades at $18.50 for delivery in western Ohio and northern Indiana, $19 in western Michigan and $19.50 in eastern Michigan

Prices per gross ton at Cleveland:

N'th'n fdy., sil. 1.75 to 2.25	$18.50
S'th'n fdy., sil. 1.75 to 2.25	19.51
Malleable	18.50
Ohio silvery, 8 per cent	28.00
Basic Valley furnace	18.50
Stand. low phos., Valley	$26.50 to 27.00

Prices are f.o.b. furnace except on Southern foundry and silvery iron. Freight rates: 50c. average local switching charge; $3 from Jackson, Ohio; $6.01 from Birmingham.

Iron Ore.—With the movement well below normal, shipments by water during May will amount only to about 6,500,000 tons. Quite a few Lake vessels have not yet gone into commission.

Semi-Finished Steel.—The leading local producer has reduced prices on contracts $1 a ton to $32, Cleveland, Youngstown and Pittsburgh, following the shading reported last week. While the market is no longer above $32, the price situation is somewhat unsettled as some $31 quotations have appeared. Specifications are holding to recent moderate volume.

Bars, Plates and Shapes.—Orders for structural shapes are holding up well, but specifications for steel bars have declined and new business is light. Plates are moving fairly well in small lots. Some long-pending municipal work in Cleveland, the Lorain Central bridge, requiring 12,000 tons, and the Stadium, taking 4000 tons, will be out for figures shortly, and inquiries are out for the Board of Education administration building, calling for 1300 tons. Bids were taken today for piers for the Lorain Central bridge, requiring 1200 tons of bars. Specifications call for stainless steel anchor bolts.

There is virtually no change in the price situation. For Cleveland delivery, local and outside mills quote steel bars at 1.80c., Cleveland, but for outside delivery 1.75c. is being quoted in some cases. Plates and shapes are firm at 1.70c. to 1.75c., Pittsburgh.

Sheets.—New demand continues rather slow. Independent mills are operating at about 70 per cent of capacity. An Ohio producer shut down one of its plants this week. Orders from the automotive industry show little change, and other consuming industries are not active. Business with steel barrel makers is not good. On black sheets, a 2.50c., Pittsburgh, price is heard more frequently, although some mills will not go below 2.55c. Auto body sheets are steady since the recent reduction to 3.70c. Galvanized sheets are selling at 3.20c. for car lots.

Rivets.—Small rivets have been reduced 5 per cent, or to 70, 10 and 5 per cent off list. When large rivets were reduced two weeks ago no change was made in small rivets. Demand for rivets is slow, the volume of business this month not keeping up to that in April.

Strip Steel.—Demand is spotty, with little change in aggregate volume of business. Good tonnages of both hot and cold-rolled strip are going to stamping plants making parts for Ford and Chevrolet cars. Hot-rolled strip mills are operating at 60 to 65 per cent of capacity, but cold-rolled mills are running at a considerably lower rate. Hot-rolled strip is firm at 1.70c., Pittsburgh, for wide and 1.80c. for narrow. Cold-rolled material is quite generally quoted at 2.45c., Cleveland, although mills are able to get $2 a ton more for quite small lots.

Coke.—The present price of $8.25, ovens, for Connellsville by-product foundry coke has been reestablished for June shipment.

Old Material.—Prices have declined 50c. a ton on heavy melting steel, machine shop turnings and short shoveling turnings and 25c. a ton on blast furnace scrap. While mills are not actively in the market, they are buying small lots when offered at attractive prices. Mills are accepting shipments on contracts subject to restrictions that have prevailed for some time.

Prices per gross ton delivered consumers' yards:

Basic Open-Hearth Grades:	
No. 1 heavy melting steel	$12.50 to $13.00
No. 2 heavy melting steel	12.00 to 12.50
Compressed sheet steel	12.50 to 12.75
Light bundled sheet stampings	11.00 to 11.50
Drop forge flashings	10.50 to 11.00
Machine shop turnings	8.50 to 9.00
Short shoveling turnings	10.00 to 10.50
No. 1 railroad wrought	13.00 to 13.50
No. 2 railroad wrought	14.00 to 14.50
No. 1 busheling	12.00 to 12.50
Pipes and flues	9.00 to 9.50
Steel axle turnings	12.50 to 13.00
Acid Open-Hearth Grades:	
Low phos., forging crops	17.75 to 18.00
Low phos., billet bloom and slab crops	18.50 to 18.75
Low phos., sheet bar crops	18.00 to 18.50
Low phos., plate scrap	18.00 to 18.50
Blast Furnace Grades:	
Cast iron borings	9.50 to 9.75
Mixed borings and short turnings	9.50 to 9.75
No. 2 busheling	9.00 to 9.25
Cupola Grades:	
No. 1 cast	15.00 to 15.50
Railroad grate bars	11.00 to 12.00
Stove plate	12.00 to 12.50
Rails under 3 ft	18.50 to 19.50
Rails for rolling	16.25 to 16.50
Railroad malleable	16.00 to 16.50
Miscellaneous:	

Detroit Scrap Still Weak

DETROIT, May 27.—While the market on old material in the district continues weak, the general opinion is that prices are about on the bottom.

Dealers' buying prices per gross ton, f.o.b. cars, Detroit:

Hvy. melting and shov. steel	$11.25 to $11.75
Borings and short turnings	7.25 to 7.75
Long turnings	6.75 to 7.25
No. 1 machinery cast	11.25 to 11.75
Automotive cast	13.50 to 14.00
Hydraul. comp. sheets	10.75 to 11.25
Stove plate	9.00 to 9.50
New No. 1 busheling	10.00 to 10.50
Old No. 1 busheling	8.75 to 9.25
Sheet clippings	8.25 to 8.75
Flashings	10.00 to 10.50

DETROIT

Moderate Curtailment of Automobile Output Probable Next Month as Models Change

DETROIT, May 26.—Estimates of probable summer activity in the automobile industry are engaging wide attention. The steady capacity output of the two leading producers during the present month is generally thought to have held May production of motor cars and trucks at about the same level as in April, or about 450,000 units. This week and last, however, curtailment has been in order at most of the other plants, and it is generally believed that this tendency will be continued for a time next month as preparations are made for the introduction of new models. If Ford and Chevrolet drop their schedules during June, the month may consequently be expected to show a moderate decline from the two preceding months, but present indications by no means point to further curtailment during July.

Tentative releases of steel for June shipment to the Ford and Chevrolet plants show little decline from May, but parts makers serving these companies have accumulated considerable surplus and are taking less material than they did last month. Ford production during May has averaged close to 9000 cars daily, but efforts to better this figure by more than 200 units have not been successful. In the last few days pressure for record production has not been so pronounced and many believe that the company is prepared to allow its output to taper off somewhat. Nevertheless, the pig iron and steel-making capacity at Fordson is being pushed to the limit, and the company has made large purchases of billets in the open market. Chevrolet output has ranged from 4500 to 5000 cars daily, and maintenance of this rate depends entirely upon dealer sales from week to week. Recent reports indicate that curtailment might be expected, but the company's tentative releases ordinarily underestimate actual requirements and it is difficult to form a conclusion.

Among the other producers, reports are generally of an optimistic character. The plans of the Chrysler organization for the Plymouth line are being watched with the most interest, as recent price reductions have placed this unit in a position to compete with Ford and Chevrolet on a price basis and every effort is being made to popularize the car by means of advertising, dealer pressure, etc. Tentative schedules call for a production of 7000 to 8000 Plymouths during June, an increase over present output, and for a doubling of production during July. Such a plan undoubtedly depends upon public approval of the product, but the organization is undoubtedly banking heavily upon its success. Improvement is also looked for in both the Dodge and Chrysler lines, although in no such large volume.

The change to an eight-cylinder motor by Buick is now given general credence in Detroit. Production has practically ceased on the old model and foundries are turning out castings on the new models. Body plants are also preparing for this model change, and the company will go into production next month on the new cars. Although Buick ordinarily brings out its new models on Aug. 1, the date may be moved forward slightly this year and capacity production during July and August is almost certain. The other General Motors units, with the exception of Cadillac-LaSalle, are doing very little. The Cadillac twin-eight is meeting with general approval and production is gradually being stepped up. Reports that the old Cadillac V-type eight would be discontinued, with LaSalle to take its place, and Buick to form the next link in the price range are credited in some quarters.

Other automobile producers are generally less active. Hudson-Essex, after various minor changes in its present models, is increasing its sales and consequent production and tentative material releases call for gradual increases. Among manufacturers not in the Michigan district, best reports come from Nash and Studebaker.

Summarizing, it would seem that the remainder of the year may see a somewhat more even distribution of the automobile business. Manufacturers of medium-priced cars have been fighting strenuously for six months to regain their relative positions in the trade. The general public has become more accustomed to deflated buying power and a reaction is setting in, in the wave of economy which swept the country following the stock market crash. Expectation of any sudden improvement in conditions has also been dissipated, and standards of living have been adjusted to a less spectacular basis. With every move made by the automobile industry to make its product more attractive and indispensable, a return to a more normal distribution of product is imminent.

Such a more equalized distribution of automobile business would be of great benefit to the steel industry, as well as to parts makers and other industries largely dependent upon the automobile makers. The concentration of activity at the Ford and Chevrolet plants has enabled many companies to maintain their automobile tonnage at a fair rate this year, but others have suffered seriously. These would be the first to benefit by any change, while some curtailment on the part of Ford and Chevrolet would not seriously handicap mills which have been serving them.

As in other centers, the worst feature of the steel market in Detroit is the price situation. Large buyers, with one possible exception, insist that this demoralization has not resulted from any consistent effort on their part, to efforts of mill representative to "buy business." Some of the lowest priced orders on consumers' books today are not for immediate shipment but may be specified against for several weeks, with the result that little advantage has been gained by price shading. While the steel market in other parts of the country has now generally settled to figures which first became common in Detroit at the beginning of the quarter, large buyers in this district now find themselves offered business on a new and lower level. Automobile body sheets recently declined $2 a ton to 3.70c., Pittsburgh, and, while black sheets are holding at 2.55c. on the general run of business, shading has appeared where extras have been involved. Bars are holding at 1.75c., Pittsburgh, and quotations on hot-rolled strip are fairly steady. On cold-rolled strip, the market level is not clearly defined, but is not above 2.45c. Pittsburgh, on tonnage lots.

Steel products not going essentially to the automobile industry are generally in better demand. Fabricated structural steel projects of 100 tons or more now actively in the market call for at least 10,000 tons, including 1950 tons for an addition to the *News* building in Detroit, 1500 tons for a bank and office building at Battle Creek, Mich., and 1500 tons for a pumping station and filtration plant at Spring Wells, near Detroit. This is the largest volume of business that has been in the market at one time all year. Reinforcing bars are more active, as also is standard pipe. Residential building, both in single houses and apartments, is at a low ebb, and even the most optimistic real estate firms are willing to admit that no further building of this type will be needed for some time. In the surrounding towns metal furniture makers have been rather busy for two months. Boiler shops in the district are also well occupied and demand for plates is normally active.

Foundry operations, following the trend of the automobile industry, are spotty, but very high in some plants. Pig iron shipments have shown gradual improvement throughout the year and are relatively heavy today, as compared with other lines. The Ford Motor Co. has an inquiry out for 6000 tons of high silicon iron. This grade

has been subject to considerable price competition in the last few months. Considerable iron from Buffalo and Cleveland is moving into this territory by water.

The scrap market is quiet, with prices weaker. A large part of the compressed sheets produced in the immediate Detroit district is moving by boat to Lake Erie consuming points, while Pittsburgh and Youngstown are taking some material from inland points. The Great Lakes Steel Corporation, which expects to start its open - hearth furnaces at Ecorse, Mich., about Aug. 1, is reported to have began purchasing hydraulic compressed sheets for July and August.

BIRMINGHAM

Pig Iron Stocks Lowest in a Year—Sheet Prices Revised Downward

BIRMINGHAM, May 27.—The probable merchant pig iron make for June is fairly well sold. A normal amount of hand-to-mouth buying is being done quietly. Despite a decline in shipments to distant territories, the movement of iron in May has exceeded production by a slight margin, and stocks on furnace yards at present are reported lower than at any time in the past year. The district melt about held its own this month. Soil pipe shops and stove foundries did not increase specifications as had been expected. The price for June delivery in the district is $14 base, Birmingham. Requests for quotations on third quarter iron are few. Furnace operations are unchanged, with a total of 17 active.

Prices per gross ton, f.o.b. Birmingham dist. furnaces:

No. 2 fdy., 1.75 to 2.25 sil.	$14.00
No. 1 fdy., 2.25 to 2.75 sil.	14.50
Basic	14.00

Finished Steel. — Quotations on black sheets have been reduced $2 a ton to 2.70c. Blue annealed and galvanized sheets are off $1 a ton, quotations now being 2.20c. and 3.40c. respectively. Other finished steel prices are the same as last week. Bookings last week were in about the same volume as in the preceding week, but compared with those of four or five weeks ago they were off considerably. All lines are feeling the effect of the caution of consumers in placing orders. This condition reflects a decreased consumption, as users of finished steel in this district are buying only as requirements demand. Inquiries are spotty, though several good prospective tonnages have been revealed. Structural steel fabricators report a very quiet week. Several large projects have been pending for the past two or three weeks. These include a 20-story hotel and a 28-story office building at Atlanta.

The Tennessee company is operating seven open-hearths at Ensley, one less than last week, and seven at Fairfield. The Gulf States Steel Co. continues to operate four at Alabama City.

Cast Iron Pipe.—Bookings by pressure pipe plants during May show a decline from the April rate, but compared with the rate one year ago there is a slight increase. Bids are to be called for in June for a project at Hattiesburg, Miss., requiring around 2000 tons. Goodman, Miss., will open bids May 27 on 6000 ft. of 4 to 6-in. pipe, and Shreveport, La., will take bids on the same date on 5970 ft. of 6-in. pipe. The United States Pipe & Foundry Co. has booked 500 tons of pipe for Loudon, Tenn., and the American Cast Iron Pipe Co. has booked the project at Laurel, Miss., requiring 5900 ft. of 8 to 12-in. pipe. Plant operations are at about the same rate as in the past several weeks, though backlogs in some instances are reported slender. Prices are firm and unchanged at $37 to $38 a ton, Birmingham.

Old Material. — The consuming demand continues to be centered on a few grades of steel scrap, which are moving in fair volume considering conditions. Recently reduced prices in these lines did not stimulate buying. No price changes were made last week.

Prices per gross ton, deliv'd Birmingham dist. consumers' yards:

Heavy melting steel	$12.00 to $12.50
Scrap steel rails	12.50 to 13.00
Short shoveling turnings	9.00
Cast iron borings	9.00
Stove plate	11.50 to 12.00
Steel axles	21.00 to 22.00
Iron axles	23.00
No. 1 railroad wrought	10.00 to 10.50
Rails for rolling	14.50
No. 1 cast	13.00
Tramcar wheels	12.50
Cast iron carwheels	13.00 to 13.50
Cast iron borings, chem.	13.50 to 14.00

CINCINNATI

Ohio Consumer Buys 2800 Tons of Pig Iron, Part for Third Quarter

CINCINNATI, May 27.—The purchase by a central Ohio consumer of 2800 tons of Northern foundry iron for second and third quarters brought the total sales of district furnace representatives to 5300 tons in the past week. The general demand for pig iron, however, continues slow. With no tonnage orders to test the price on Southern iron, district representatives are adhering to $13, base Birmingham. On substantial tonnages concessions might be made. Southern iron, however, is not in great demand. Current orders being for scattered carload lots. The only inquiry before the trade is from a northern Ohio melter for 700 tons of Northern foundry iron.

Prices per gross ton, deliv'd Cincinnati:

So. Ohio fdy., sil. 1.75 to 2.25	$20.89 to $21.39
Ala. fdy., sil. 1.75 to 2.25	16.69 to 17.69
Ala. fdy., sil. 2.25 to 2.75	17.19 to 18.19
Tenn. fdy., sil. 1.75 to 2.25	17.19 to 17.69
S'th'n Ohio silvery, 8 per cent	26.89

Freight rates, $1.89 from Ironton and Jackson, Ohio; $3.69 from Birmingham.

Finished Steel.—With reports of increased activity in the radio field, the leading sheet mill interest indicates that an early quickening of demand from this source is anticipated. General demand, however, continues at about 50 to 60 per cent of capacity, with production staying abreast of new business. The bulk of the district demand is for road construction.

Old Material.—Reflecting the slowness of demand in other lines of the industry, the old material market is quiet and featureless. Dealers, while holding to present quotations on scrap, are not buying without reasonable assurance of being about to place the material purchased. Mills are taking scrap on contract, but shipments are being held to actual needs.

Dealers' buying prices per gross ton, f.o.b. cars, Cincinnati:

Heavy melting steel	$11.00 to $11.50
Scrap rails for melting	12.25 to 12.75
Loose sheet clippings	8.00 to 8.50
Bundled sheets	10.00 to 10.50
Cast iron borings	8.00 to 8.50
Machine shop turnings	7.50 to 8.00
No. 1 busheling	9.50 to 10.00
No. 2 busheling	6.00 to 6.50
Rails for rolling	13.00 to 13.50
No. 1 locomotive tires	13.50 to 14.00
No. 2 railroad wrought	11.00 to 11.50
Short rails	17.50 to 18.00
Cast iron carwheels	12.00 to 12.50
No. 1 machinery cast	17.50 to 18.00
No. 1 railroad cast	14.50 to 15.00
Burnt cast	8.25 to 8.75
Stove plate	8.25 to 8.75
Brake shoes	8.25 to 8.75
Agricultural malleable	14.00 to 14.50
Railroad malleable	15.00 to 15.50

Warehouse Prices, f.o.b. Cincinnati

	Base per Lb.
Plates and struc. shapes	3.40c.
Bars, soft steel or iron	3.30c.
New billet reinforc. bars	3.30c.
Rail steel reinforc. bars	3.15c.
Hoops	4.05c.
Bands	3.50c.
Cold-fin. rounds and hex.	3.85c.
Squares	4.35c.
Black sheets (No. 24)	4.05c.
Galvanized sheets (No. 24)	4.90c.
Blue ann'l'd sheets (No. 10)	3.45c.
Structural rivets	4.20c.
Small rivets	60 per cent off list
No. 9 ann'l'd wire, per 100 lb.	$3.00
Com. wire nails, base per keg (25 kegs or more)	2.95
Cement c't'd nails, base 100 lb. keg	2.95
Chain, per 100 lb.	10.25
	Net per 100 Ft.
Lap-welded steel boiler tubes, 2-in.	$16.50
4-in.	34.50
Seamless steel boiler tubes, 2-in.	17.50
4-in.	36.00

Bethlehem Steel Co. has placed an order with H. A. Brassert & Co., engineers, Chicago, for three 24x100 ft. high efficiency hot-blast stove linings. These stoves will consist of the Brassert octagonal checker tile with graduated filler inserts. This is the second set of Brassert stoves to be installed by Bethlehem at its Johnstown plant.

PACIFIC COAST

Steel Buying in Small Volume and Inquiries of Importance Are Few

SAN FRANCISCO, May 24 (*By Air Mail*).—Steel business is quiet. Few new inquiries of importance came out for figures. Important lettings included 400 tons for a church and apartment structure in San Francisco, placed with the McClintic-Marshall Co., and 1071 tons of cast iron pipe for Los Angeles, divided between two companies.

Reinforcing steel awards totaled 815 tons. The largest, 200 tons for an office building at Phoenix, Ariz., was secured by the Allison Steel Co. New inquiries include 700 tons for a pier shed in San Francisco, 800 tons for a school in Honolulu, 450 tons for a hotel at Eureka, Cal., and 350 tons for a hospital at Palo Alto, Cal. Out-of-stock quotations in the San Francisco district continue at 2.30c., base, on carload lots. Los Angeles prices are $2 a ton higher. Merchant bar steel continues to move in small lots only. Prices are firmer at 2.35c., c.i.f.

The only plate award of importance, 150 tons for a penstock at Centralia, Wash., went to the Commercial Boiler Works. Pending business is confined to lots of less than 100 tons. Prices now are firm at 2.25c., c.i.f.

Awards of structural shapes aggregated 965 tons. The Pacific Coast Engineering Co. took 315 tons for a Salvation Army building in Oakland. Bids will be opened May 28 on 1800 tons for a department store at Portland, Ore. On June 2, bids will be opened on 566 tons for a bridge over the Salinas River at Gonzales, Cal. Plain material is firm at 2.35c., c.i.f.

Warehouse Prices, f.o.b. San Francisco

	Base per Lb.
Plates and struc. shapes..	2.45c. to 2.95c.
Soft steel bars.....	2.40c. to 2.95c.
Black sheets (No. 24).....	3.65c. to 4.30c.
Blue ann'l'd sheets (No. 10)	3.05c. to 3.55c.
Galv. sheets (No. 24).....	4.30c. to 4.80c.
Struc. rivets, ½-in. and larger.....	5.65c.
Com. wire nails, base per keg.....	$3.40
Cement c't'd nails, 100 lb. keg.....	3.40

Pig Iron.—Demand for both foundry coke and pig iron remains light. Little or no improvement is noted in the rate of operations among jobbing foundries. No change in quotations has occurred recently.

Prices per gross ton at San Francisco:

*Utah basic	$25.00 to $26.00
*Utah fdy., sil. 2.75 to 3.25	25.00 to 26.00
**Indian fdy., sil. 2.75 to 3.25	25.00 to 26.00

*Delivered San Francisco.
**Duty paid, f.o.b. cars San Francisco.

Cast Iron Pipe.—Demand for cast iron pipe remains exceptionally quiet. Los Angeles placed 301 tons of 16-in. Class 150 pipe with the National Cast Iron Pipe Co. and 770 tons of 20-in. Class B pipe with the United States Pipe & Foundry Co. Bids were opened on 133 tons for Long Beach, Cal. Steel pipe continues to move in small lots only. No important line pipe inquiries are up for figures.

A steamer sailed from here May 22 with 800 tons of scrap rails for Kobe, Japan; another steamer is loading 2000 tons of heavy melting steel for Japan and will go to Tampa and Houston for additional scrap; another boat is due to start loading 700 tons of scrap rails late this week for Japan, upon its arrival from Philadelphia, where it is taking on scrap. Demand from domestic mills is virtually at a standstill. The American Steel & Wire Co., Worcester, Mass., has shut down one open-hearth furnace and is not buying skeleton or heavy melting steel. One New England consumer is buying small tonnages of shafting, but Pennsylvania mills are not interested. Scrap prices in general continue to decline, but because of the lack of actual transactions in some materials it is rather difficult to really establish prices.

Buying prices per gross ton, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel..	$8.50 to	$9.00
Scrap T rails	8.50 to	9.00
Scrap girder rails	7.50 to	8.00
No. 1 railroad wrought...	9.00 to	9.50
Machine shop turnings....	4.50 to	5.00
Cast iron borings (steel works and rolling mill)	4.50 to	5.00
Bundled skeleton, long...	6.75 to	7.25
Forge flashings	7.50 to	8.00
Blast furnace borings and turnings	4.50 to	4.75
Forge scrap	7.00 to	7.50
Shafting	12.50 to	13.00
Steel car axles.....	15.50 to	16.00
Wrought pipe, 1 in. in diameter (over 2 ft. long)	7.75 to	8.00
Rails for rolling	9.00 to	9.50
Cast iron borings, chemical	9.00 to	9.50

Prices per gross ton deliv'd consumers' yards:

Textile cast	$12.00 to	$12.50
No. 1 machinery cast.....	14.50 to	15.00
No. 2 machinery cast.....	13.50 to	14.00
Stove plate	10.00 to	10.50
Railroad malleable	15.50 to	16.00

BOSTON

New England Furnace Sells a Week's Output—Scrap Prices Continue Weak

BOSTON, May 27.—Pig iron sales by the Mystic Iron Works the past week totaled 4300 tons, the equivalent of about one week's output. Details are withheld as to whom the iron was sold, but it is assumed that most of it will go outside New England. Representatives of other furnaces report business as duller than at any time in recent years, with no indication of a buying movement within the near future. Some foundries are holding up contract iron shipments because work they expected to secure has not developed. The New England weekly melt is perhaps a shade less than on May 1.

Foundry iron prices per gross ton deliv'd to most New England points:

†Buffalo, sil. 1.75 to 2.25..	$20.28 to $21.28
†Buffalo, sil. 2.25 to 2.75..	20.78 to 21.78
*Buffalo, sil. 1.75 to 2.25..	20.91 to 21.91
*Buffalo, sil. 2.25 to 2.75..	21.41 to 22.41
Va., sil. 1.75 to 2.25.....	25.21
Va., sil. 2.25 to 2.75.....	25.71
*Ala., sil. 1.75 to 2.25.....	22.61
*Ala., sil. 2.25 to 2.75.....	23.11
†Ala., sil. 1.75 to 2.25.....	18.75
†Ala., sil. 2.25 to 2.75.....	19.25

Freight rates: $4.91 all rail and $4.28 rail and water from Buffalo; $5.21 all rail from Virginia; $9.61 all rail from Alabama and $5.75 rail and water from Alabama to New England seaboard.
*All rail rate.
†Rail and water rate.

Cast Iron Pipe.—Salem, Mass., closed bids May 20 on 190 tons of 12 and 16-in. pipe, but has made no award. The National Cast Iron Pipe Co. was the low bidder, making a price under $30 a ton, f.o.b. foundry. The United States Pipe & Foundry Co. was low bidder on 170 tons of pipe required by Malden, Mass., and R. D. Wood & Co. on 110 tons wanted by Lowell, Mass., but no awards have been made. Business the past week was confined to car lots. Prices appear a little steadier and generally are quoted at $36 a ton, on cars foundry, for 6-in. and larger.

Reinforcing Bars.—Small sales of billet steel bars in the past week totaled less than 300 tons. Two Cambridge, Mass., jobs and one at Providence, R. I., with an aggregate of 500 tons, are up for figures. Prices are holding as follows: One to 5-ton lots, 3.06½c. a lb., base, from stock; 5 to 99 tons, 2.56½c.; 100 tons and larger lots, 2.46½c. No important rail steel bar business is in the making. The next big job coming up will not be figured until July, for Worcester, Mass., road work. Rail steel bars are 2.26½c. a lb., base, delivered Boston freight rate points.

Old Material.—Activity in scrap centers largely in the export market.

Tube-Turns, Inc., Louisville, Ky., manufacturer of seamless, short-radius forged fittings for pipe welding, has appointed the following distributers: Grinnell Co., Charlotte, N. C.; Ebbert & Kirkman Co., Inc., of Birmingham; B. Hoffmann Mfg. Co., Milwaukee; United Pipe & Supply Co., Charleston, W. Va.; Vulcan Copper & Supply Co., Cincinnati, and Hedley & Voisinet, Buffalo.

Warehouse Prices, f.o.b. Boston

	Base per Lb.
Plates	3.365c.
Structural shapes—	
Angles and beams.....	3.365c.
Tees	3.365c.
Zees	3.465c.
Soft steel bars, small shapes.....	3.265c.
Flats, hot-rolled	4.15c.
Reinforcing bars .....3.265c. to	3.54c.
Iron bars—	
Refined	3.265c.
Best refined	4.60c.
Norway rounds	6.60c.
Norway squares and flats.....	7.10c.
Spring steel—	
Open-hearth .....5.00c. to	10.00c.
Crucible .....12.00c.	
Tie steel .....4.50c. to	4.75c.
Bands .....4.015c. to	5.00c.
Hoop steel .....5.50c. to	6.00c.
Cold-rolled steel—	
Rounds and hex.....*3.55c. to	5.55c.
Squares and flats....*4.05c. to	7.05c.
Toe calk steel.....	6.00c.
Rivets, structural or boiler.....	4.50c.

	Per Cent Off List
Machine bolts .....50 and	5
Carriage bolts .....50 and	5
Lag screws .....50 and	5
Hot-pressed nuts .....50 and	5
Cold-punched nuts .....50 and	5
Stove bolts .....70 and	10

*Including quantity differentials.

ST. LOUIS

Scrap Prices Recede Further — Granite City Mill Meets Lower Chicago Quotations

ST. LOUIS, May 27.—There was very little buying of pig iron during the last week. A Southern maker sold approximately 2500 tons and the St. Louis Gas & Coke Corporation sold 1500 tons. The local maker's shipments are said to be equal to the movement in 1928 at this time, but slightly below that at this period last year. An improvement in the melt of stove and furnace manufacturers and implement makers in the district is reported but the steel mills are using less iron.

Prices per gross ton at St. Louis:

No. 2 fdy., sil. 1.75 to 2.25, f.o.b. Granite City, Ill.	$19.00
Malleable, f.o.b. Granite City	19.00
N'th'n No. 2 fdy., deliv'd St. Louis	21.16
Southern No. 2 fdy., deliv'd	17.42
Northern malleable, deliv'd	21.16
Northern basic, deliv'd	21.16

Freight rates: 75c. (average) Granite City to St. Louis; $2.16 from Chicago; $4.42 from Birmingham.

Finished Steel.—The Granite City Steel Co. has met competition by reducing prices as follows: Galvanized sheets, 3.30c. black sheets, 2.65c., both f.o.b. Gary, and tank plates, 1.80c., Chicago. Blue annealed No. 13 gage and No. 10 gage are unchanged at 2.35c. and 2.20c. respectively, f.o.b. Gary. A slight improvement is reported in business. Tin plate constitutes the brightest spot in the demand, specifications coming in nicely, and Granite City Steel Co. operations are at 80 to 85 per cent of capacity. Several railroads have released schedules covering rail requirements. The St. Louis Car Co. will build 130 street cars here for the Detroit electric railways. The structural trade is quiet.

Old Material.—The week brought further recessions in scrap prices. Nos. 1 and 2 heavy melting and shoveling steel and No. 2 railroad wrought declined 25c., while No. 1 locomotive tire steel car axles and No. 1 railroad wrought, are 50c. lower; machine shop turnings, cast iron car wheels and No. 1 machinery cast are 75c. off; steel angle bars and wrought iron bars and transoms are quoted $1 and $2 lower respectively. Consumers in the district are showing no interest in the market. Dealers have only a few orders outstanding, and they are expected soon to take advantage of present low prices to lay down material in their yards.

Railroad lists are light, including: Missouri-Kansas-Texas, 900 tons; New York, Chicago and St. Louis, 46 carloads; Chicago & Eastern Illinois, 12 carloads, and St. Louis-San Francisco, six carloads.

Dealers' buying prices per gross ton, f.o.b. St. Louis district:

Selected heavy melting steel	$11.50 to $12.00
No. 1 heavy melting or shoveling steel	11.00 to 11.25
No. 2 heavy melting or shoveling steel	10.00 to 10.50
No. 1 locomotive tires	13.50 to 14.00
Misc. stand.-sec. rails including frogs, switches and guards, cut apart	11.50 to 12.00
Railroad springs	13.75 to 14.25
Bundled sheets	8.00 to 8.50
No. 2 railroad wrought	10.75 to 11.25
No. 1 busheling	9.75 to 10.25
Cast iron borings and shoveling turnings	9.25 to 9.75
Iron rails	11.00 to 11.50
Rails for rolling	12.50 to 13.00
Machine shop turnings	6.00 to 6.50
Heavy turnings	9.00 to 9.50
Steel car axles	15.50 to 16.00
Iron car axles	25.50 to 26.00
Wrot. iron bars and trans.	16.00 to 16.50
No. 1 railroad wrought	9.50 to 10.00
Steel rails, less than 3 ft.	14.00 to 14.50
Steel angle bars	10.50 to 11.00
Cast iron carwheels	12.75 to 13.25
No. 1 machinery cast	12.75 to 13.25
Railroad malleable	13.25 to 13.75
No. 1 railroad cast	11.50 to 12.00
Stove plate	10.00 to 10.50
Relay. rails, 60 lb. and under	20.50 to 23.50
Relay. rails, 70 lb. and over	26.50 to 29.00
Agricult. malleable	12.00 to 12.50

Warehouse Prices, f.o.b. St. Louis

	Base per Lb.
Plates and struc. shapes	3.25c.
Bars, soft steel or iron	3.15c.
Cold-fin. rounds, shafting, screw stock	3.75c.
Black sheets (No. 24)	4.25c.
Galv. sheets (No. 24)	4.85c.
Blue ann'l'd sheets (No. 10)	3.45c.
Black corrug. sheets (No. 24)	4.30c.
Galv. corrug. sheets	4.90c.
Structural rivets	4.15c.
Boiler rivets	4.15c.
	Per Cent Off List
Tank rivets, ¾-in. and smaller, 100 lb. or more	65
Less than 100 lb.	60
Machine bolts	60
Carriage bolts	60
Lag screws	60
Hot-pressed nuts, sq., blank or tapped, 200 lb. or more	60
Less than 200 lb.	50
Hot-pressed nuts, hex., blank or tapped, 200 lb. or more	60
Less than 200 lb.	50

YOUNGSTOWN

Finishing Mill Operations Are Subject to Frequent Variations

YOUNGSTOWN, May 26.—Activity in line pipe and fairly well sustained specifications for flat-rolled steel products have improved sentiment in Valley mills, although the price situation is anything but encouraging. With the exception of pipe mills, the schedules of which have been steadily increasing in recent weeks, finishing mill operations are unsteady and subject to a considerable variation from week to week. Changes in open-hearth steel production are also frequent, and if there is a trend it is downward.

The industry in the Valleys is maintaining a steel making rate this week of about 60 per cent of capacity, with finishing mill schedules somewhat higher. On sheets the average is about 70 per cent, and it is slightly higher on hot-rolled strip. Bar mills are engaged at 65 to 70 per cent of capacity, and buttweld pipe at about 60 per cent. The electric welding pipe mill of the Republic Steel Corporation is running full, and the company's larger unit is expected to go into production late next month. Seamless mills are well engaged. Lapweld business, while confined to small orders, is in fair aggregate volume. Tin mill production has dropped sharply in the last few weeks.

Demand for steel products from Valley mills is probably better diversified than it has been at any time this year, but is restricted in practically every line. Specifications are numerous, but tonnage releases are characteristically light and represent only immediate demands of users. Large consumers of steel, who characteristically carry at least a month's supply of raw materials, have cut their inventories to as little as one-third of normal, and frequently demand overnight deliveries. This is particularly true of consumers in the immediate Youngstown territory, who may rely absolutely upon their usual sources of supply. Fabricators of building products are running at 75 to 80 per cent of last year, which is considered rather good, but have not backlog orders to justify future commitments. Shipments to the automobile industry are going principally to Ford and Chevrolet, and consequently are benefiting mills in varying degrees. Increased production in other motor car plants during the summer promises a more evenly distributed tonnage.

Valley mills are attempting to meet price competition in a limited way, but at the same time are attempting to maintain quoted schedules on the general line of business. Prices on semi-finished steel have declined to a range of $31 to $32, Youngstown, on billets, slabs and sheet bars, with the lower price confined to only a few users. Valley mills are now quoting auto body sheets at 3.70c., following the recent decline of $2 a ton, and minimum quotations on black, galvanized and blue annealed sheets are 2.55c., 3.20c., and 2.15c., respectively. Light plates from jobbing mills are being fairly well maintained at 2c., Pittsburgh, although continuous mills are quoting $4 less, and occasionally making even lower prices. The market on tin mill black plate has also weakened, and Valley mills have gone to 2.75c., Pittsburgh, at times unsuccessfully. The bar price is well maintained at 1.75c., Pittsburgh. On plates, the market is quotable at 1.70c. to 1.75c., and wire prices are generally holding in a market which offers little opportunity for testing.

Pig iron quotations are unchanged at $18.50, Valley, for basic and foundry iron, and $19 for malleable and Bessemer. Lower prices at other centers have developed some shading in competitive territory. The scrap market retains some strength in spite of lower quotations at Pittsburgh. Hydraulic compressed sheets are moving into this district from interior Michigan points on contracts figuring back to higher prices than the present offering figure at Pittsburgh. Mills are showing no interest in further scrap purchases.

BUFFALO

Pig Iron Buying in Small Lots Only—Steel Mill Operations at 80 Per Cent

BUFFALO, May 27.—Buffalo furnaces sold during the past week approximately 3500 tons of pig iron, all in small lots. Most buyers are covering only for immediate needs, though producers believe that this policy will result in a buying movement in some lines within the next month. They point out that some of the heater and boiler foundries have been reducing inventories consistently since last October and that they must soon come into the market. Shipments during May have been equal to those of April, though this was attained only by the addition of the barge movement. There is as yet no third quarter inquiry.

Prices per gross ton f.o.b. furnace:

No. 2 fdy., sil. 1.75 to 2.25	$18.50
No. 2X fdy., sil. 2.25 to 2.75	19.00
No. 1 fdy., sil. 2.75 to 3.25	20.00
Malleable, sil. up to 2.25	19.00
Basic	17.50
Lake Superior charcoal	27.28

Finished Steel.—Operations of Buffalo mills are at approximately 80 per cent, and it does not appear that there will be any immediate increase. The volume of inquiry for fabricated structural steel in small lots has been better in the past week, but competition is pressing prices down. The principal award was a power house for Clinton Prison at Dannemora, N. Y.

Old Material.—The market is very quiet, and appears to be weakening. Predictions are being freely made that the largest consumer in this district will not pay more than $13.50 on its next purchase of No. 1 heavy melting steel and that the second largest purchaser will not pay more than $14. Regulation of shipments is general, and restrictions have been put in effect by a user of No. 1 heavy melting steel and blast furnace scrap, a user of No. 2 heavy melting steel and a stove plate user.

Prices per gross ton f.o.b. Buffalo consumers' plants:

Basic Open-Hearth Grades:		
No. 1 heavy melting steel	$13.50 to	$14.00
No. 2 heavy melting scrap	11.50 to	12.00
Scrap rails		14.00
Hydraul. comp. sheets	11.50 to	12.00
Hand bundled sheets	10.00 to	10.50
Drop forge flashings	11.50 to	12.00
No. 1 busheling		12.25
Hvy. steel axle turnings	13.00 to	13.50
Machine shop turnings	8.00 to	8.50
No. 1 railroad wrought	10.50 to	11.00
Acid Open-Hearth Grades:		
Knuckles and couplers	16.50 to	17.00
Coil and leaf springs	16.50 to	17.00
Rolled steel wheels	16.50 to	17.00
Low phos. billet and bloom ends	17.50 to	18.00
Electric Furnace Grades:		
Short shov. steel turnings	11.00 to	11.25
Blast Furnace Grades:		
Short mixed borings and turnings	10.00 to	10.50
Cast iron borings	10.00 to	10.50
No. 2 busheling		7.00
Rolling Mill Grades:		
Steel car axles	16.50 to	17.00
Iron axles	19.50 to	20.00
Cupola Grades:		
No. 1 machinery cast	11.00 to	11.50
Stove plate	11.50 to	12.00
Locomotive grate bars	10.00 to	10.50
Steel rails, 3 ft. and under	16.50 to	17.00
Cast iron carwheels	11.50 to	12.00
Malleable Grades:		
Industrial		16.00
Railroad		16.00
Agricultural		16.00
Special Grades:		
Chemical borings	11.50 to	12.00

Warehouse Prices, f.o.b. Buffalo

	Base per Lb.
Plates and struc. shapes	3.40c.
Soft steel bars	3.30c.
Reinforcing bars	2.95c.
Cold-fin. flats and sq.	3.65c.
Rounds and hex.	3.15c.
Cold-rolled strip steel	5.85c.
Black sheets (No. 24)	4.20c.
Galv. sheets (No. 24)	4.85c.
Blue ann'l'd sheets (No. 10)	3.50c.
Com. wire nails, base per keg	$3.20
Black wire, base per 100 lb.	3.50

Canada

Hesitation in Buying Prevails in Dominion

TORONTO, May 27.—The principal pig iron demand is for small prompt shipments, and business of this nature is well sustained. Many of the smaller melters will not place orders for other than immediate needs. While business as a whole is down about 12 per cent from that of last year, it runs about 7 per cent higher than in 1928. At the present time competition in the Ontario market from the United States is negligible, this being due to the fact that current iron prices here are approximately $1 a ton under the Buffalo prices, when duty and freight are taken into consideration.

Prices per gross ton:

Delivered Toronto	
No. 1 fdy., sil. 2.25 to 2.75	$22.60
No. 2 fdy., sil. 1.75 to 2.25	22.10
Malleable	22.60
Delivered Montreal	
No. 1 fdy., sil. 2.25 to 2.75	$24.00
No. 2 fdy., sil. 1.75 to 2.25	23.50
Malleable	24.00
Basic	22.50
Imported Iron, Montreal Warehouse	
Summerlee	$33.50
Carron	33.00

Old Material.—Business in the iron and steel scrap market borders on stagnation. Inquiries have practically disappeared, and the only sales during the week were in small lots for spot delivery. No future buying is being done. Mills are out of the market.

Dealers' buying prices:

	Per Gross Ton	
	Toronto	Montreal
Heavy melting steel	$9.00	$8.00
Rails, scrap	11.00	9.00
No. 1 wrought	9.00	11.00
Machine shop turnings	7.00	6.00
Boiler plate	7.00	6.50
Heavy axle turnings	7.50	6.50
Cast borings	6.50	5.00
Steel borings	6.50	6.00
Wrought pipe	6.00	6.00
Steel axles	14.00	17.00
Axles, wrought iron	16.00	19.00
No. 1 machinery cast	....	16.00
Stove plate	....	12.00
Standard carwheels	....	14.50
Malleable	....	13.00
Per Net Ton		
No. 1 mach'ry cast	$15.00	....
Stove plate	11.00	....
Standard carwheels	14.00	....
Malleable scrap	11.00	....

Structural Steel.—While announcements have been made regarding some large construction work, the demand for steel has shown but small improvement. Fabricators, however, are well supplied with orders and most plants are running at full time. In connection with the proposed $2,000,000 bridge to join the mainland at Caughnawaga with LaSalle on Montreal Island, contracts to be placed for fabricated steel alone will run upward of $1,000,000.

New Ship Program to Take 125,000 Tons of Steel

WASHINGTON, May 27.—Approximately 125,000 tons of steel is estimated as the requirements for the 34 merchant ships of 361,250 gross tons toward whose construction the Shipping Board has loaned more than $93,000,000 under the Jones-White law. The total cost of the vessels, all to be built in American yards, is about $125,000,000. In addition to these loans, the Shipping Board has also authorized loans aggregating almost $3,000,000 for reconstruction and improvement of 12 vessels engaged in private American shipping enterprises. The iron and steel, machinery and other requirements for the new and reconstructed ships are all obtained from American sources.

The New York Shipbuilding Co., Camden, N. J., has been awarded a contract to build two 30,000-ton steamships for United States Lines, Inc., at a total cost of $21,000,000. They will be the largest ships ever built in American yards. United States Lines, Inc., will also build two larger ships, of the Leviathan type.

Scrap Institute Organizes Pacific Coast Chapter

Morris Davidson of M. Davidson Co., Stockton, Cal., was elected president of the Pacific Coast chapter of the Institute of Scrap Iron and Steel, Inc. Thirty-five charter members joined the Pacific Coast chapter at the first meeting. I. J. Miller, Eureka Supply Co., Los Angeles, was elected chairman of the executive board. The Pacific Coast chapter covers 11 States, including California, Oregon, Washington, Nevada, Utah, Arizona, Colorado, Montana, Idaho, Wyoming and New Mexico.

Deliveries of Non-Ferrous Ingots Decline

The combined deliveries of brass and bronze ingots and billets by the members of the Non-Ferrous Ingot Metal Institute for April amounted to 6041 tons. This compares with 6632 tons in March, with 6898 tons in February and with 6154 tons in January.

Lukens Steel Co. has removed its Philadelphia office from the Commercial Trust Building to the Broad Street Station Building, on Pennsylvania Boulevard and the Parkway.

Non-Ferrous Metal Markets

Copper Inactive but Firm—Tin Dull—Lead and Zinc Unchanged

NEW YORK, May 27.

Copper.—A new record in sales for foreign shipment has already been made this month. The total to date has been about 99,500 gross tons, and it is confidently expected that 100,000 tons will easily be passed between now and the end of the month. The next largest total was about 91,000 tons in May, 1928. An interesting feature of the sales this month is that a large majority was for shipment during May, indicating low stocks abroad. Foreign consumers still have considerable to buy for June, it is stated. Sales at present are only running about 1000 tons a day, as against the very heavy sales a couple of weeks ago. Domestic buyers are also contracting for light shipments, rendering the entire market very quiet. Total sales for foreign and domestic shipment will reach a very large figure, perhaps breaking previous records.

The price situation is very firm, with electrolytic copper quoted at 13c., delivered in the Connecticut Valley, and with the price of Copper Exporters, Inc., at 13.30c. c.i.f., usual European ports. One commentator states that some fabricators, who booked considerable business on a basis of 12.50c. copper, were unable to obtain sufficient metal at that price and therefore are not anxious to experience any change in present levels. It is believed that domestic buyers still have considerable copper to buy for June. Sales in general have covered part of July, with some August metal included. Lake copper has been active but is quiet now and firm at 13c. to 13.12½c., delivered.

Tin.—There has been almost no buying the past week and the market is stagnant, consumers, having made large purchases recently, are not interested. They are awaiting with interest statistics for May. There was another large increase in warehouse stocks in England for the week ended May 24, the expansion being 583 tons, bringing the total stocks to 19,284 tons. Expectations are that there will be a large increase in the world's visible supply at the end of the month and that May deliveries into consumption in this country will be exceedingly small. There are also estimates that shipments from the Straits will come close to 10,000 tons for the month.

THE WEEK'S PRICES. CENTS PER POUND FOR EARLY DELIVERY

	May 27	May 26	May 24	May 23	May 22	May 21
Lake copper, New York	13.12½	13.12½	13.12½	13.12½	13.12½	13.12½
Electrolytic copper, N. Y.*	12.75	12.75	12.75	12.75	12.75	12.75
Straits tin, spot, N. Y.	31.75	31.62½	....	31.25	31.62½	32.12½
Zinc, East St. Louis	4.62½	4.62½	4.62½	4.62½	4.62½	4.62½
Zinc, New York	4.97½	4.97½	4.97½	4.97½	4.97½	4.97½
Lead, St. Louis	5.40	5.40	5.40	5.40	5.40	5.40
Lead, New York	5.50	5.50	5.50	5.50	5.50	5.50

*Refinery quotation; price ¼c. higher delivered in the Connecticut Valley.

Rolled Products

List Prices, Per Lb., f.o.b. Mill

On Copper and Brass Products, Freight up to 75c. per 100 Lb. Allowed on Shipments of 500 Lb. or Over

Sheets—
- High brass ..... 19.75c.
- Copper, hot rolled ..... 22.75c.
- Zinc ..... 10.00c.
- Lead (full sheets) ..... 8.25c.

Seamless Tubes—
- High brass ..... 24.75c.
- Copper ..... 25.00c.

Rods—
- High brass ..... 18.75c.
- Naval brass ..... 21.50c.

Wire—
- Copper ..... 14.87½c.
- High brass ..... 20.25c.

Copper in Rolls ..... 21.75c.
Brazed Brass Tubing ..... 27.25c.

Aluminum Products in Ton Lots

The carload freight rate is allowed to destinations east of Mississippi River and also to St. Louis on shipments to points west of that river.

Sheets, 0 to 10 gage, 3 to 30 in. wide ..... 31.30c.
Tubes, base ..... 42.00c.
Rolled rods in coils ..... 31.00c.

Chicago Warehouse

(Prices Cover Trucking to Customers' Doors in City Limits)

Sheets—	Base per Lb.
High brass	19.75c.
Copper, hot rolled	22.75c.
Copper, cold rolled, 14 oz. and heavier	25.00c.
Zinc	10.00c.
Lead, wide	10.05c.
Seamless Tubes—	
Brass	24.75c.
Copper	25.00c.
Brass Rods	18.00c.
Brazed Brass Tubes	27.25c.

New York or Cleveland Warehouse

Delivered Prices, Base per Lb.

High brass	19.75c.
Copper, hot rolled, base sizes	22.75c.
Copper, cold rolled, 14 oz. and heavier, base sizes	25.00c.
Seamless Tubes—	
Brass	24.75c.
Copper	25.00c.
Brass Rods	18.00c.
Brazed Brass Tubes	27.25c.

New York Warehouse

Delivered Prices, Base per Lb.

Zinc sheets (No. 9), casks	10.25c. to 10.75c.
Zinc sheets, open	11.25c. to 11.75c.

Metals from New York Warehouse

Delivered Prices, Per Lb.

Tin, Straits pig	34.00c. to 35.00c.
Tin, bar	36.00c. to 37.00c.
Copper, Lake	14.75c.
Copper, electrolytic	14.50c.
Copper, casting	14.25c.
Zinc, slab	6.25c. to 7.25c.
Lead, American pig	6.50c. to 7.00c.
Lead, bar	8.00c. to 8.50c.
Antimony, Asiatic	10.25c. to 10.75c.
Aluminum No. 1 ingots for remelting (guaranteed over 99% pure)	25.00c. to 26.00c.
Alum. ingots, No. 12 alloys	24.00c. to 25.00c.
Babbitt metal, commercial grade	25.00c. to 35.00c.
Solder, ½ and ½	23.75c. to 24.75c.

Metals from Cleveland Warehouse

Delivered Prices, Per Lb.

Tin, Straits pig	36.38c.
Tin, bar	38.38c.
Copper, Lake	14.00c.
Copper, electrolytic	14.00c.
Copper, casting	13.75c.
Zinc, slab	7.00c. to 7.25c.
Lead, American pig	6.25c. to 6.50c.
Lead, bar	8.75c.
Antimony, Asiatic	14.00c.
Babbitt metal, medium grade	17.50c.
Babbitt metal, high grade	42.50c.
Solder, ½ and ½	23.75c.

Old Metals, Per Lb., New York

Buying prices represent what large dealers are paying for miscellaneous lots from smaller accumulators and selling prices are those charged consumers after the metal has been properly prepared for their uses.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	10.25c.	11.75c.
Copper, hvy. and wire	10.00c.	11.25c.
Copper, light and bottoms	8.75c.	10.25c.
Brass, heavy	5.75c.	7.25c.
Brass, light	4.75c.	6.00c.
Hvy. machine composition	8.50c.	9.50c.
No. 1 yel. brass turnings	5.75c.	6.75c.
No. 1 red brass or compos. turnings	7.75c.	8.75c.
Lead, heavy	4.00c.	4.62½c.
Lead, tea	3.00c.	3.50c.
Zinc	2.50c.	3.00c.
Sheet aluminum	7.50c.	9.50c.
Cast aluminum	7.00c.	9.00c.

Spot Straits tin was quoted today at 31.75c., New York. London quotations were about £2 a ton higher than a week ago, with spot standard quoted at £143 5s., future standard, at £145 5s. and spot Straits also at £145 5s. The Singapore price today was £147 2s. 6d.

Lead.—Buying is confined to carload and small lots for early shipment, and there has been an absence of contracting on a large scale for June. This is expected to develop almost any day. Prices are unchanged, at 5.50c., New York, as the contract quotation of the leading interest. The quotation in the outside market is 5.40c., St. Louis.

Zinc.—Buying of prime Western zinc is spasmodic but, when the total for the month is figured up, it is expected to be comfortably large. Quotations still range from 4.60c. to 4.65c., East St. Louis, or 4.95c. to 5c., New York. Some producers will not sell below 4.65c., while there are others who will take business at concessions down to 4.60c.

Ore prices fell another $2 a ton and stood at $31, Joplin, at the end of the week, May 24. Production last week was estimated at about 9000 tons, with shipments at 9949 tons and sales at about 9200 tons, leaving the surplus estimated at about 11,260 tons. There are expectations that the ouput will now be curtailed.

Antimony.—Demand is exceedingly light and Chinese metal is quoted at 7.35c. a lb., New York, duty paid, for prompt delivery, with futures at 7.25c.

Nickel.—Ingot nickel in wholesale lots is quoted at 35c. a lb., with shot nickel at 36c. and electrolytic nickel in cathodes at 35c.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is obtainable at the published price of 23.90c. a lb., delivered.

Non-Ferrous Metals at Chicago

CHICAGO, May 27.—This market is quiet with current sales being made at extreme close ranges. Lead prices are easier following tendencies in foreign markets. The old metal market is dull and prices are unchanged.

Prices per lb., in carload lots: Lake copper, 13.25c.; tin, 32.50c.; lead, 5.50c.; zinc, 4.75c.; in less-than-carload lots, antimony, 8.35c. On old metals we quote copper wire, crucible shapes and copper clips, 9.50c.; copper bottoms, 8c.; red brass, 8c.; yellow brass, 6c.; lead pipe, 4.25c.; zinc, 2c.; pewter, No. 1, 17.50c.; tin-foil, 20c.; block tin, 26.50c.; aluminum, 8.50c.; all being dealers' prices for less-than-carload lots.

Reinforcing Steel

Awards of 8350 Tons — New Inquiries About 6000 Tons

THE largest award of reinforcing steel the past week was 2200 tons for highway work in New Jersey. Other tonnages were mostly in small lots, amounting in all to 8350 tons. New projects of about 6000 tons were less than half of the tonnage in the previous week. Awards follow:

NEW YORK, 700 tons, building on Seventh Avenue for Warner Brothers Pictures, Inc., placed by White Construction Co. with Concrete Steel Co.

BROOKLYN, 360 tons, subway section 5, route 110, placed by Necaro Co. with Concrete Steel Co.

STATE OF NEW JERSEY, 2200 tons, highway sections 3 and 4, route 25, placed by Arthur McMullen Co., New York, with Joseph T. Ryerson & Son, Inc.

MORRISTOWN, N. J., 200 tons, sewage disposal plant, to Joseph T. Ryerson & Son, Inc.

READING, PA., 300 tons, Berks County jail, to McClintic-Marshall Co.

SHEBOYGAN, WIS., 1000 tons, power house for Wisconsin Power & Light Co., to American System of Reinforcing; previously reported as 200 tons.

BALTIMORE, 550 tons, Post Office, to Joseph T. Ryerson & Son, Inc.

BORDELONVILLE, LA., 300 tons, floodgate, to Laclede Steel Co.

CHICAGO, 900 tons, warehouse for Commonwealth Edison Co., to Olney J. Dean & Co.; previously reported as 600 tons to an unnamed bidder.

CHICAGO, 570 tons, footings for outer bridge, to Concrete Steel Co.

CHICAGO, 700 tons, railroad express building for Chicago & North Western, to an unnamed bidder.

STATE OF ILLINOIS, 300 tons, road work; 100 tons to Calumet Steel Co., 200 tons to Olney J. Dean & Co.

MINNEAPOLIS, 100 tons, church, to Laclede Steel Co.

STATE OF IOWA, 100 tons, road work, to Olney J. Dean & Co.

STATE OF WISCONSIN, 100 tons, road work, to Olney J. Dean & Co.

TUCSON, ARIZ., 100 tons, hospital for Southern Pacific Co., to an unnamed bidder.

PHOENIX, ARIZ., 200 tons, office building, First and Adams Streets, to Allison Steel Co.

CENTRALIA, WASH., 125 tons, power house, to Pacific Coast Steel Corporation.

SAN DIEGO, CAL., 100 tons, two dormitories for Army and Navy Academy, to an unnamed bidder.

SAN FRANCISCO, 175 tons, California Ink Building, to Pacific Coast Steel Corporation.

SAN FRANCISCO, 113 tons, church and apartment building, Ellis and Taylor Streets, to Gunn, Carle & Co.

Reinforcing Bars Pending

Inquiries for reinforcing steel bars include the following:

CAMBRIDGE, MASS., 300 tons, F. L. Webster Co. plant.

CAMBRIDGE, 100 tons, Harvard College unit No. 4.

PROVIDENCE, R. I., 100 tons, chain store.

PENNSYLVANIA RAILROAD, 400 tons, bridge over Hackensack River in New Jersey; general contract awarded to Frederick Snare Corporation, New York.

PHILADELPHIA, 100 tons, school on Summerdale Avenue.

PHILADELPHIA, 200 tons, administration building for Philadelphia school district.

CLEVELAND, 1200 tons, Fulton Road bridge; Republic Steel Corporation, low bidder.

URBANA, ILL., tonnage being estimated, Women's Building for University of Illinois.

CHICAGO, 400 tons, Chicago Yacht Club building.

SACRAMENTO, 128 tons, highway work in Santa Clara County; bids June 11.

SAN FRANCISCO, 700 tons, pier shed No. 15; bids being taken.

SAN FRANCISCO, 442 tons, school on Ostego Street; bids being taken.

MARE ISLAND, CAL., 10± tons, shell houses; bids being taken.

HONOLULU, 800 tons, school; bids being taken.

EUREKA, CAL., 450 tons, hotel; bids June 2.

PALO ALTO, CAL., 136 tons, gymnasium; bids being taken.

PALO ALTO, 350 tons, hospital; bids being taken.

Railroad Equipment

Current Buying in Small Lots— No Change Expected Soon

RAILROAD equipment buying is in small lots. The only large business pending is the inquiry of the Illinois Central for about 2300 freight cars, on which bids will be closed next week. When these orders are out of the way, it is unlikely that any further equipment business of size will come before the trade before fall, according to all present indications. Details of the week's business follow:

Fruit Growers Express has ordered 166 steel underframes from Pressed Steel Car Co.

Youngstown Sheet & Tube Co. has ordered 128 mine cars from Enterprise Wheel & Car Corporation.

Erie has awarded contract for 20 suburban coaches to Standard Steel Car Co.

Chesapeake & Ohio has bought four air-dump cars from Magor Car Corporation.

Reading is inquiring for 10 locomotive tenders.

General American Tank Car Corporation has ordered one switching engine from American Locomotive Co.

Canadian Pacific has ordered 150 ore cars from Canadian Car & Foundry Co.

Anaconda Copper Mining Co. is inquiring for 17 tank cars.

Illinois Central is inquiring for nine coaches and six compartment coaches, in addition to 20 suburban cars and 15 baggage-express cars recently inquired for. Bids will be closed by this road next week on about 2300 freight cars.

Detroit Street Railroad has ordered 130 street cars from St. Louis Car Co.

Chicago Great Western has asked bids on 15 locomotives of 2-10-4 type.

Steel Merger Trial Is Set for June 16 by Agreement

Attorneys for both sides in the battle to prevent the sale of the Youngstown Sheet & Tube Co. to the Bethlehem Steel Corporation have agreed to ask the court at Youngstown to set June 16 as the date to begin the case. A petition has been filed in Mahoning County courts by C. S. Eaton and associates seeking to restrain the two companies from merging, and an answer has been filed by the Sheet & Tube - Bethlehem interests. An amended petition in the suit will be filed by the Eaton attorneys.

Fabricated Structural Steel

Awards Decline to 31,000 Tons but New Inquiry of 37,000 Tons Is in Excess of That of Previous Week

AWARDS of structural steel in the past week, totaling about 31,000 tons, were the smallest since the final week of April. Included in this total were two buildings in New York of 4500 tons each, one an office building, the other an addition to the department store of R. H. Macy & Co. A subway section in New York requires 3100 tons and a terminal building in Chicago for the Chicago & North Western Railroad 4800 tons.

New projects totaling about 37,000 tons exceeded those of the previous week. The largest new inquiries were 12,000 tons for the Lorain-Central bridge in Cleveland and 4000 tons for a stadium in the same city. Awards follow:

HARTFORD, CONN., 1000 tons, State office building, to Levering & Garrigues Co.

BOSTON, 200 tons, city hospital administration building, to New England Structural Co.

LYNN, MASS., 200 tons, General Electric Co. auditorium and cafeteria, to New England Structural Co.

HOLTON, ME., 120 tons, hotel, to Palmer Steel Co.

WEST STEWARTOWN, N. H., 120 tons, State bridge, to Kittridge Bridge Co.

MONTPELIER, VT., 196 tons, hotel, to unnamed fabricator.

NEW HAVEN, CONN., 2100 tons, State office building, to Levering & Garrigues.

NEW YORK, 4500 tons, addition to store of R. H. Macy & Co., to A. E. Norton, Inc.

NEW YORK, 4500 tons, building at Broadway and Forty-first Street, to Hedden Iron Construction Co.

NEW YORK, 300 tons, apartment building at 216 East Fifty-sixth Street, to an unnamed fabricator.

NEW YORK, 1130 tons, building at 29 West Forty-seventh Street, to Heddon Iron Construction Co.

NEW YORK, 850 tons, loft building at Ninth Avenue and Thirty-first Street, to Levering & Garrigues.

NEW YORK, 3100 tons, Houston Street subway section, tunnel under East River, to Bethlehem Steel Co.

NEW YORK, 300 tons, garage at 318 East Forty-eighth Street, to Kues Brothers.

NEW YORK, 1100 tons, Pier 34, foot of Spring Street, Hudson River, to American Bridge Co.

JAMAICA, L. I., 200 tons, Bank of United States building.

OSSINING, N. Y., 600 tons, mission house, to Lehigh Structural Steel Co.

WEIRTON, W. VA., 1800 tons, extensions for Weirton Steel Co., to McClintic-Marshall Co.

PITTSBURGH, 150 tons, two barges for American Sand & Gravel Co., to Dravo Contracting Co.

EMPORIUM, PA., 150 tons, highway bridge, to American Bridge Co.

GALLIPOLIS, OHIO, 200 tons, highway bridge, to American Bridge Co.

NORFOLK & WESTERN RAILWAY CO., 235 tons, passenger station at Portsmouth, Ohio, to Virginia Bridge & Iron Co.

BALTIMORE & OHIO RAILROAD, 200 tons, bridge, to Mount Vernon Bridge Co.

ECORSE, MICH., 1100 tons, plant building for Michigan Steel Corporation, to Whitehead & Kales Co.

ENGLEWOOD, ILL., 200 tons, building for American Can Co., to unnamed fabricator.

MORGAN PARK, ILL., 470 tons, school, to A. F. Anderson Iron Works, Chicago.

CHICAGO, 300 tons, railroad viaduct at Crawford Avenue, to Hansell-Elcock Co.

CHICAGO, 4800 tons, express terminal building for Chicago & North Western Railroad, to an unnamed fabricator.

SIOUX FALLS, S. D., 750 tons, Tenth Street viaduct, to American Bridge Co.

CENTRALIA, WASH., 150 tons, plates, penstock, to Commercial Boiler Works.

OAKLAND, CAL., 315 tons, building for Salvation Army, to Pacific Coast Engineering Co.

SAN FRANCISCO, 400 tons, church and apartment building, Ellis and Taylor Streets, to McClintic-Marshall Co.

LOS ANGELES, 100 tons, store, Wilshire near Virgil Street, to McClintic-Marshall Co.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

ELLSWORTH, ME., 100 tons, County Court House.

ITHACA, N. Y., 600 tons, law school building, Cornell University.

WHITE PLAINS, N. Y., 200 tons, building for Frank G. Shattuck Co.

STATE OF NEW YORK, 1400 tons, highway bridges.

BALTIMORE, 1570 tons, underpass on Eastern Avenue.

PHILADELPHIA, 2500 tons, administration building for Philadelphia school district.

BRISTOL, PA., 250 tons, building for Bell Telephone Co.

STATE OF NEW JERSEY, 105 tons, bridge over Reading Railroad tracks at Tuckahoe, N. J.

CHICAGO, 5300 tons, Lane Technical High School; Hansell-Elcock Co., low bidder on structural steel.

MEADVILLE, PA., 200 tons, addition for Crawford County Trust Co.

WHEELING, W. VA., 265 tons, Twelfth Street garage.

BATTLE CREEK, MICH., 1500 tons, bank and office building; Waldbridge Adinger Co., general contractor.

TOLEDO & OHIO CENTRAL RAILROAD, 1200 tons, bridge.

CLEVELAND, 650 tons, Fisher Body Corporation Building.

CLEVELAND, 120 tons, building for Lamson & Sessions Co.

CLEVELAND, 4000 tons, stadium for city.

CLEVELAND, 12,000 tons, Lorain Central Bridge.

CLEVELAND, 1300 tons, administration building for Board of Education.

CLEVELAND, 300 tons, Melrose-Woodbine Exchange for Ohio Bell Telephone Co.

URBANA, ILL., 400 tons, Women's Building for University of Illinois.

CHICAGO, 450 tons, St. Margaret's School.

CHICAGO, 1700 tons, open-hearth building for Wisconsin Steel Co.

STATE OF MINNESOTA, 600 tons, highway bridge.

MINNEAPOLIS, 2500 tons, building for Northwest Bell Telephone Co.

STATE OF WISCONSIN, 1500 tons, highway bridge.

SANTA FE RAILROAD, 440 tons, track elevation at Wichita, Kan.

PORTLAND, ORE., 1800 tons, Meir & Frank Store; bids May 28.

PORTLAND, 149 tons, bridge over Clackamas River at Carver, Ore.; bids June 9.

SACRAMENTO, 135 tons, overhead crossing in Nevada County; bids June 11.

MONTEREY, CAL., 566 tons, bridge over Salinas River; bids June 2.

Steel Treaters Hold Group Meeting

(*Concluded from page* 1614)

dress on "My Impressions of Japan." Mr. Lucas was one of the official delegates to the World Engineering Congress in Tokio, Japan, last fall. Besides relating experiences on the trip to Japan and the high character of the party, Mr. Lucas told something of the splendid and cordial reception in Japan and of the technical meetings, at some of which he presided. Mr. Lucas also lectured at two of Japan's large universities before leaving Japan. He also threw on the screen some reproductions of photographs taken by himself, illustrative of Japan's people and scenery.

Of particular interest were the photographs of the home of Dr. Honda, the celebrated Japanese metallurgist and scientist, who has visited this country several times and lectured at technical conventions and universities. Dr. George K. Burgess, director, United States Bureau of Standards, Washington, accompanied Mr. Lucas on these excursions to Dr. Honda's home and to the universities.

Metallurgy of Aircraft

"Aircraft Metallurgy" was the topic of Mr. Knerr of Philadelphia, who delivered the formal technical paper of the evening, and the only one of the day's meeting. Mr. Knerr's work in this field is well known and he speaks with authority. His address was an elaboration of an article of his in an issue of *Aircraft Engineering* last year. It was chiefly a running comment on lantern slides showing the wide use of steel and light alloys in aircraft, landing fields, hangars, etc. He discussed the production of some of the alloys and alloy steels, and their heat treatment, and covered the subject in a broad manner.

Dinner to New York Officers

On Thursday evening Secretary Eisenman invited the officers and executive committee of the New York chapter to a dinner at the Hotel Roosevelt, at which various important policies of the society were discussed. Mr. Eisenman is getting the opinions of the executive committees of various chapters.

It was announced that the 1931 convention and exhibition of the society will be held in Boston, probably in September.

Exports Down One-Eighth in April

Decline of Finished Steel in Four Months Was 30 Per Cent—
Imports Dropped 5 Per Cent in April

WASHINGTON, May 24.—Declining 29,693 gross tons, exports of iron and steel products from the United States were 208,640 tons in April, compared with 238,333 tons in March. The April shipments, however, exceeded by 11,214 tons those of February, with a total of 197,214 tons. In the four months ended April, exports showed a drop of 212,170 tons from 1929, all accounted for by the decline of 243,697 tons in rolled and finished steel shipped abroad.

Imports in April totaled 52,650 tons, a decline of 2954 tons under March, with a total of 55,604 tons. In the four months ended April, imports were 26,102 tons under last year, despite an increase of 12,547 tons in rolled and finished steel. Declining imports of scrap accounted for three-fourths of the total reduction.

The outstanding feature of April exports was the slump in shipments to Canada. They dropped 25,778 tons to 75,464 tons, from 101,242 tons in March, and were 36.1 per cent of the total in place of 42.4 per cent. In the four months ended April shipments to Canada were 327,102 tons, a decline of 96,371 tons under last year.

Discussion that the sharp drop in business with the United States steel industry's best outside customer is due to agitation over the Hawley-Smoot tariff bill is held to lack substance, whatever may be the result of the new Canadian tariff which went into effect May 1. The new Canadian tariff having been non-existent in April, manifestly shipments from the United States to Canada in that month were not affected by provisions of the measure itself.

It is held to be conceivable, but not convincing in the absence of actual figures, that buying from the United States was curtailed in anticipation of greater preference in rates on imports from the United Kingdom. The fact remains, however, that this would hardly explain the drop in exports from the United States to Canada during the four months of the current year. Moreover, the movement in international trade for some time has been slowed up and has pertained to Canada as well as to other countries.

Exports of Iron and Steel from the United States

(In Gross Tons)

	April		Four Months Ended April	
	1930	1929	1930	1929
Pig iron	1,327	7,631	7,099	19,601
Ferromanganese	1,387	86	3,109	821
Scrap	47,907	42,622	202,586	151,033
Pig iron, ferroalloys and scrap	*50,621*	*50,339*	*212,794*	*171,455*
Ingots, blooms, billets, sheet bar	2,316	6,440	10,767	20,335
Skelp	5,399	11,377	32,235	24,877
Wire rods	4,299	4,551	16,837	17,089
Semi-finished steel	*12,014*	*22,368*	*59,839*	*62,301*
Steel bars	11,424	22,032	41,142	79,451
Alloy steel bars	740	1,501	3,359	9,495
Iron bars	77	514	580	3,242
Plates, iron and steel	12,150	18,006	46,692	69,471
Sheets, galvanized steel	7,477	14,083	37,346	61,500
Sheets, galv. iron (a)	372		2,176	
Sheets, black steel	12,105	14,936	50,966	64,318
Sheets, black iron	858	1,117	4,249	4,646
Hoops, bands, strip steel	3,824	8,059	18,599	30,350
Tin plate; terne plate	23,137	25,991	94,802	103,543
Structural shapes, plain material	12,665	20,790	58,814	84,267
Structural material, fabricated	6,897	7,157	39,291	40,656
Tanks, steel (a)	1,328	.....	6,035	.....
Steel rails	13,704	21,369	34,957	66,678
Rail fastenings, switches, frogs, etc.	1,953	3,408	6,776	11,505
Boiler tubes	2,362	1,568	7,172	6,664
Casing and oil-line pipe	6,944	9,476	30,572	56,242
Pipe, black and galvanized, welded iron (a)	1,090	11,616	7,084	47,885
Pipe, black and galvanized, welded steel (a)	7,085		31,940	
Plain wire	3,339	4,142	11,042	18,820
Barbed wire and woven wire fencing	4,763	5,137	13,380	23,884
Wire cloth and screening	102	116	569	610
Wire rope	468	586	1,743	2,678
Wire nails	666	1,069	2,568	6,207
Other nails and tacks	570	1,409	2,247	4,170
Horseshoes	3	6	49	130
Bolts, nuts, rivets and washers, except track	908	1,281	4,252	5,687
Rolled and finished steel	*137,011*	*195,369*	*558,402*	*802,099*
Cast iron pipe and fittings	2,036	2,467	13,079	10,780
Malleable iron screwed fittings	889	1,151	4,633	4,512
Car wheels and axles	1,183	1,745	4,761	9,435
Iron castings	644	1,267	2,772	5,090
Steel castings	2,123	531	4,464	4,049
Forgings	761	1,027	3,514	5,554
Castings and forgings	*7,636*	*8,188*	*33,223*	*39,420*
All other	1,358	1,309	5,231	6,384
Total	208,640	277,573	869,489	1,081,659

(a) Not separately reported prior to 1930.

Imports of Iron and Steel Products into the United States

(In Gross Tons)

April, 1930

Austria	14	Sweden	2,244
Belgium	12,675	Switzerland	3
Czechoslovakia	34	United Kingdom	4,270
Denmark	7	Canada	4,097
France	4,709	Mexico	39
Germany	10,945	Cuba	29
Italy	150	British India	10,814
Netherlands	814	Japan	2
Norway	1,499		
Poland and Danzig	305	Total	52,650

Imports of Iron and Steel into the United States

(In Gross Tons)

	April		Four Months Ended April	
	1930	1929	1930	1929
Pig iron	12,183	6,693	42,345	47,672
Ferromanganese*	5,153	7,372	19,475	22,294
Ferrosilicon†	846	636	2,408	2,843
Ferrochrome‡	.....	20	87	99
Scrap	1,770	7,584	10,030	29,778
Pig iron, ferroalloys and scrap	*19,952*	*22,305*	*74,345*	*102,686*
Steel ingots, blooms, billets and slabs	1,347	2,610	6,351	7,849
Wire rods	1,019	1,339	4,433	4,482
Semi-finished steel	*2,366*	*3,949*	*10,784*	*12,331*
Rails and splice bars	428	13	1,846	984
Structural shapes	15,122	12,300	54,576	42,089
Boiler and other plates	1	1,220	1,329	2,275
Sheets and saw plates	3,962	1,068	10,883	4,965
Steel bars	4,168	3,437	13,331	11,190
Bar iron	213	299	624	1,089
Hoops, bands and cotton ties	2,394	2,664	6,554	6,479
Tubular products (wrot.)	1,426	2,565	7,918	13,854
Nails, tacks, staples	322	549	1,635	2,362
Tin plate	18	3	46	92
Bolts, nuts, rivets and washers	58	26	155	93
Round iron and steel wire	487	778	1,694	2,504
Barbed wire	406	742	1,790	1,993
Flat wire; strip steel	114	160	555	595
Steel telegraph and telephone wire	16	.....	17	.....
Wire rope and strand	311	193	988	802
Other wire	19	47	159	187
Rolled and finished steel	*29,465*	*26,064*	*104,100*	*91,553*
Cast iron pipe	645	1,778	4,012	12,688
Castings and forgings	222	241	678	763
Total	52,650	54,337	193,919	220,021
Manganese ore*	26,700	30,577	117,434	85,082
Iron ore	313,069	284,841	1,110,384	948,021
Magnesite (dead burned)	81	4,122	12,870	8,653

*Manganese content only.
†Silicon content only.
‡Chromium content only.

Steel Tariff Still an Issue in Britain

Stanley Baldwin Credits Increased American and Continental Output to Protection—Large Contracts Pending in Africa and India

(*By Cable*)

LONDON, ENGLAND, May 26.

FORMER Premier Stanley Baldwin is urging a protective tariff for steel, stating in a speech at Middlesbrough that the sole cause of increased steel production in the United States, Germany, France and Belgium during the past 43 years was the "great increase in tariff," adding that the "United States has employed the United Kingdom as a very happy hunting ground when their own absolutely preserved markets were flooded" and asking "why should we allow that?" He advocated "British work for British hands, British trade with British lands."

Philip Snowden, in the House of Commons, replying to opposition charges that the budget has imposed fresh taxation upon industry, preventing creation of adequate reserves for reequipment and extensions, said that the situation today is largely due to capital in prosperous days paying away profits in high dividends and bonus shares, illustrating his statement by details of the financial history of Baldwin's, Ltd., Ebbwvale Iron & Steel Co., and the Consett Iron & Steel Co. The result of this financial improvidence was, he said, that those companies today "are in a condition of inefficiency, making it quite impossible for them to further compete successfully."

The Ebbwvale and Consett companies have repudiated the charges, the latter saying that since 1918 it has expended £5,000,000 to £6,000,000 on new plant, of which more than half was taken from reserves and it claims that its plant is "one of the most efficient in existence today."

"British Work for British Hands, British Trade With British Lands," says Stanley Baldwin.

* * *

Machinery and Equipment Purchases of $150,000,000 to $200,000,000 offered to Britain by Soviet Union if Credits Are Granted.

* * *

Soviet Union to Unify Steel Mill Operation, Purchasing and Sales. May Include Manganese Ore.

* * *

German Federation of Metal Industries Asks Government to Protest United States Tariff.

The Sheffield Chamber of Commerce has issued a statement that British industry cannot continue to shoulder the present excessive burdens and retain its position in world markets. Failing considerable curtailment of national expenditures, conditions will grow worse until general industrial revival becomes impossible, for the present path is surely leading to disaster.

New Steel Mergers Planned

The Wigan Coal & Iron Co., and the Pearson & Knowles interests are proposing a merger by separating the fuel from the steel interests and forming the Wigan Coal Corporation with a capital of £1,746,555, and the Lancashire Steel Corporation, with capital of £5,750,000. The Securities Management Trust, which holds shares in the Bankers' Industrial Development Co., will take up £500,000 of the capital in the new steel corporation.

John Brown & Co. propose a financial reorganization by reducing their capital to £2,375,000, by writing off £1,812,500 loss.

Large Contracts in India and Africa

Workman, Clark & Co. will build a 25,000-ton floating whaling factory in Norway. Beecroft Partners, Ltd., Sheffield, are erecting the first steel foundry in Egypt at Port Said, the equipment being supplied by British makers.

The Indian Government is issuing a new loan of £7,000,000 for railroad construction and general needs. The impending development of Nyassaland includes bridging the Zambesi and extension of existing railroads at a cost of £3,250,000, linking Lake Nyassa and Beira. United Kingdom rail mills have booked 45,000 tons of heavy sections for South Africa.

Saul Bron, chairman of the Soviet

British and Continental European Export Prices per gross ton, f.o.b. United Kingdom Ports, Hamburg and Antwerp, with the £ at $4.8665 (par)

British Prices f.o.b. United Kingdom Ports

Ferromanganese, export	£10	15s.	to £11	15s.	$52.30 to $57.17
Billets, open-hearth	6	0	to 6	10	29.20 to 31.63
Black sheets, Japanese specifications	12	5			59.61
Tin plate, per base box	0	18½	to 0	18½	4.46 to 4.50
					Cents a Lb.
Steel bars, open-hearth	8	0	to 8	10	1.74 to 1.85
Beams, open-hearth	7	7½	to 7	17½	1.60 to 1.71
Channels, open-hearth	7	12½	to 8	12½	1.66 to 1.87
Angles, open-hearth	7	7½	to 7	17½	1.60 to 1.71
Black sheets, No. 24 gage	9	15	to 10	0	2.12 to 2.17
Galvanized sheets, No. 24 gage	11	17½			2.57

Continental Prices, f.o.b. Antwerp or Hamburg

Foundry iron, 2.50 to 3.00 per cent sil., 1.00 per cent and more phos.	£3	2½s.	to £3	3½s.	$15.21 to $15.45
Billets, Thomas	4	13	to 4	14	22.63 to 22.87
Wire rods, low C., No. 5 B.W.G.	6	2	to 6	4	29.69 to 30.19
Rails, light	6	0			29.20
Black sheets, No. 31 gage, Japanese	11	5	to 12	12	54.68 to 58.32
					Cents a Lb.
Steel bars, merchant	5	7½			1.18
Steel bars, deformed	5	6½	to 5	7½	1.17 to 1.18
Beams, Thomas, British standard	5	1	to 5	2½	1.11 to 1.14
Channels, Thomas, American sections	5	12	to 5	14	1.24 to 1.26
Angles, Thomas, 4-in. and larger, over ⅜-in. thick	5	6			1.17
Angles, Thomas, 3-in.	5	7½			1.18
Hoop and strip steel over 6-in. base	5	15			1.27
Wire, plain, No. 8 gage	6	9			1.41
Wire, barbed, 4-pt. No. 12 B.W.G.	10	10			2.28
Wire nails, base	6	12½			$1.44 a keg

Union trade delegation here, says that Russia could place orders for £15,000,000 to £20,000,000 for machinery and equipment in one year if credits were arranged. For steel purchases, two years' credit would be required, for agricultural equipment, three years, and for shipbuilding, four years.

Continental Output Declines

German industrial depression is general. April pig iron output was 901,358 metric tons with only 90 furnaces operating out of 175. Raw steel output in April was 1,033,383 tons and rolled steel production was 737,355 tons.

French production also shows signs of slackening and output has been reduced to permit stocks to be decreased. Domestic competition is increasing. April output of pig iron was 859,000 metric tons and of raw steel 791,000 tons.

General conditions here and on the Continent are unchanged and business is now looking forward to early autumn for a genuine revival. Pig iron stocks are accumulating, but furnaces are maintaining prices. Steel makers are urgently in need of orders, but new shipbuilding and general export trade are still quiet. The Continental situation is still without improvement and Luxemburg is now blowing out furnaces. British consumers are quite indifferent.

British merchants are meeting the Continental Steel Cartel delegation in London this week to discuss their position and the merchants will offer a suggestion that 10 British merchants be included in Class A and 15 in Class B.

Tin Plate Business Steady

The tin plate market is steady, but business is hampered by weakness in the tin price, which is causing consumers to delay buying. No large orders are reported, but mills are well booked and not pressing for sales.

The Continent at present is the best export market for tin plate, with the Far East especially quiet. Galvanized sheet orders are small and large bookings are so urgently needed that several mills have closed.

Germans Urge Scrap Export as Prices Decline

HAMBURG, GERMANY, May 12.—The market for steel scrap in Europe is so depressed that the prices paid by consumers in the first half of May were the lowest since the armistice. In an effort to improve the situation, the scrap trade is urging the Government to grant more licenses for export of scrap. For No. 1 heavy melting steel the best price paid in the Ruhr this month was 47 m. ($11.19) a metric ton, while bundled sheets brought 43 m. ($10.23), blast furnace scrap 36 m. ($8.57), and No. 1 machinery cast 60 m. ($14.28).

Europe Reduces Price on Cotton Ties

HAMBURG, GERMANY, May 12.—The cotton tie export price for the market in the United States has been reduced to $52.50 a gross ton, or $1.05 a bundle of 45 lb., c.i.f. Gulf ports, and a further reduction is expected. When the cotton tie market opened in the United States in March the price was 85c. a bundle, f.o.b. Gulf ports, for spot shipment or at option of the mill. The Continental prices on cotton ties to other leading markets, such as Egypt and the Sudan, are unchanged.

Gelsenkirchen Controls United Steel Works

The Gelsenkirchen Mining Co., Germany's third largest corporation, has acquired control of 57 per cent of the capital stock of the United Steel Works, Dusseldorf. Established in 1926 by the Gelsenkirchen and Thyssen interests, it is the largest producer of iron and steel in Europe. Henceforth the Gelsenkirchen and Phœnix companies will operate in close cooperation. The Gelsenkirchen Bergwerks, with the aid of capital raised in the United States, has recently expanded its production by acquisition of smaller companies.

New Cartel Extras Number More Than 500

The Continental Steel Cartel has introduced uniform size and packing extras on steel products. Certain of these have been effective for some time, but now all are to be applied by members of the cartel. Buyers are opposing a number of these extras, and enforcement appears doubtful on exports to Great Britain and elsewhere in Europe. For example, 60c. a metric ton is charged on all tonnages for which the shipping mark is received too late. The total number of extras, including dimension, quality and tolerance is more than 500, and the trade complains that business will be complicated as a result.

Soviet Union Unifies Steel Industry

MOSCOW, May 8.—Reorganization of the iron, steel and manganese ore industry has been undertaken through formation of a state union of iron and steel industries and ore and manganese mining. This organization, known as the "Stal," is under control of the Supreme Council of Economy, has a capital in excess of 1,000,000,000 rubles and controls corporations employing 230,000 workers.

Establishment of such a union became necessary from the increased importance of the iron and steel industry under the five-year plan of industrialization. The union at present includes the Yugostahl, largest steel plant in Russia, Ural Mining & Smelting Co., Bielgor Corporation and the South Russian Steel Corporation. At Stalingrad the Krasni October Company and other smaller plants are included. Negotiations have been instituted with the Government of Transcaucasia for transfer to the "Stal" of the Georgian manganese mines.

The chief function of the "Stal" will be to plan, regulate and technically conduct production, direct the purchase of raw materials, organize sales and deal with labor questions.

Dutch Interest Adds Third Blast Furnace

WASHINGTON, May 20.—The third blast furnace added to the plant of the N. V. Koninklijke Nederlandsche Hoogovens en Stallfabrieken, Ijmuiden, Netherlands, will produce about 500 metric tons in 24 hr. and is built as a complete unit, with its own bunkers for ore and coke, air heaters, casting room, gas cleaner and other supplemental equipment, says a report to the Department of Commerce.

German Metal Federation Protests Tariff

HAMBURG, GERMANY, May 12.—A petition urging protest against proposed United States duties on metal products has been forwarded to the German Government by the Reichsbund der Deutschen Metallwarenindustrie (Federation of the German Metal Industry). It is pointed out that there is a large export surplus of American shipments of all products to Germany over German shipments to the United States.

Automobile Parts Lead Shipments to Germany

HAMBURG, GERMANY, May 12.—Analysis of the imports of American steel and hardware by Germany in the first quarter of this year shows that 78 per cent consisted of materials shipped to assembly plants of American motor car companies and spare parts for American machinery in Germany. The remaining 22 per cent was alloy steel, hand tools, razor blades and similar products.

Uniform Hack Saw List Used

HAMBURG, GERMANY, May 12.—Makers of hack saw blades in the United States, Great Britain and Germany are now selling for export on a uniform price list. German makers have urged uniform discounts, but a number of makers, including the American companies, accepted only the list, refusing to agree to fixed discounts.

Machinery Markets and News of the Works

Large Order for Presses

Chicago Company Buys $1,000,000 Worth of Presses—General Business Dull

OUTSTANDING in a dull machinery market is an order for about $1,000,000 worth of stamping presses for the Majestic Household Utilities Corporation, which is affiliated with the Grigsby-Grunow Co., Chicago, manufacturer of Majestic radios. The Majestic Household Utilities Corporation, which will manufacture electric refrigerators, is still placing orders for machine tools on a program which will total about $2,000,000. The Nash Motors Co. has also been placing fairly large orders in the Chicago market.

Aside from these developments and the prospect that the Amtorg Trading Corporation, New York, will soon place orders for several million dollars worth of machine tools for a ball-bearing plant to be built in Russia, the machine tool markets are dull both as regards current orders and prospective business.

At Cleveland some business has developed from steel companies. The Youngstown Sheet & Tube Co. has bought a number of machines for its pipe department, and the Republic Steel Corporation has completed the purchase of tools for its new electric welded pipe unit. The Yoder Co., Cleveland, bought about 10 machines.

Reports are general that May business probably will fall below the April volume. Except for the orders mentioned, buying has been largely confined to single tools. Inquiries are less numerous. In many sections manufacturers are showing no interest in placing orders, even though they have inquired for equipment.

New York

NEW YORK, May 27.—Nothing of an encouraging character has developed in the machine tool market. Most of the local sellers report that their total orders for May will fall below those of April, and the outlook is not bright for the next few months, so far as can at present be foreseen. Not only have orders fallen off, but inquiries also. During the earlier months of the year the volume of inquiries was fairly heavy, even though a large part did not materialize in orders. Now, it appears, users of machine tools are neither buying nor inquiring for tools. The only large prospective business in the near future is that likely to be placed by the Amtorg Trading Corporation for a ball bearing manufacturing plant in Russia. Machine tool orders may run into several million dollars.

Brooklyn Union Gas Co., 176 Remsen Street, Brooklyn, will issue bonds in amount of $18,000,000, part of proceeds to be used for construction of by-products plant at Greenpoint, L. I., and other expansion.

Robins Dry Dock Co., 25 Broadway, New York, has plans for extensions and improvements in machine shop at Brooklyn plant, to cost about $55,000. Tilt-Hargen Co., 90 West Broadway, is architect and engineer.

American Cyanamid Co., 535 Fifth Avenue, New York, has secured sulphur rights at Jefferson Island salt dome, held by Jefferson Lake Oil Co., near New Orleans, and contemplates plant for commercial production, to cost over $1,300,000 with machinery.

Frank J. Schefcik, 29-28 Hunter Avenue, Long Island City, architect, has plans for six-story automobile service, repair and garage building, to cost about $250,000 with equipment.

Thomas & Betts Co., 15 Park Row, New York, manufacturer of electrical fittings, conduits, etc., has awarded general contract to Morrison & Sherman, 675 Garden Street, Elizabeth, N. J., for three-story plant at Elizabethport, N. J., 80 x 180 ft., to cost over $90,000 with equipment. Lockwood Greene Engineers, Inc., 100 East Forty-second Street, New York, is architect and engineer.

Consolidated Gas Co., 4 Irving Place, New York, is arranging call for bids for three-story equipment and repair shop, 100 x 100 ft., to cost over $300,000 with equipment. Company engineering department is in charge.

Port of New York Authority, 75 West Street, New York, is planning construction of fourteen-story inland freight and distributing terminal on block bounded by West Fifteenth and Sixteenth Streets, Eighth and Ninth Avenues, with installation of elevating, conveying and other mechanical-handling equipment, entire project to cost $15,000,000. Engineering department will be in charge.

Delaware, Lackawanna & Western Coal Co., 120 Broadway, New York, has awarded general contract to Deakman Wells Co., 921 Bergen Avenue, Jersey City, N. J., for new coal pockets and railroad trestle at Jersey City, to include installation of elevating, loading and other mechanical-handling equipment, to cost over $400,000. Company engineering department is in charge.

Board of Education, Park Avenue and Fifty-ninth Street, New York, is arranging a vocational school building program to cost about $15,000,000, including structures and equipment. W. C. Martin, Flatbush Avenue Extension and Concord Street, Brooklyn, is architect for board.

Sinclair Consolidated Oil Corporation, 45 Nassau Street, New York, has arranged for increase in common stock from 10,000,000 to 20,000,000 shares, part of proceeds to be used for expansion in refineries and oil properties. Company recently acquired Pierce Petroleum Corporation, Sand Springs, Okla., and is negotiating for merger with Prairie Oil & Gas Co., Independence, Kan.

Wilson Welder & Metal Co., Inc., Terminal Building, Hoboken, N. J., manufacturer of welding equipment, parts, etc., has begun work on new one-story plant, 147 x 210 ft., at North Bergen, N. J., for which general contract recently was let to Bonanno Brothers, Inc., 1837 Bergen Turnpike, North Bergen, to cost over $70,000 with equipment. William A. Tilton, 76 Montgomery Street, Jersey City, N. J., is architect.

Board of Chosen Freeholders, Passaic County, Court House, Paterson, N. J., will soon take bids on general contract for new County airport on Paterson-Hamburgh Turnpike, Preakness, N. J., including hangars, repair shop and other field units, to cost about $200,000 with equipment. Austin Co., 120 Broadway, New York, is architect and engineer.

Silber's Display Service, Newark, has leased floor in building at 54 Branford Street for manufacture of advertising signs and displays.

Adam Black & Sons, Inc., 54 Cambridge Avenue, Jersey City, N. J., manufacturer of automobile bodies, has awarded general contract to A. W. Crone & Son, Inc., 338 Palisade Avenue, for new one-story plant, 150 x 260 ft., to cost over $75,000 with equipment. William Nuemann, 26 Journal Square, is architect.

Board of Education, High School, Devon Street, Kearny, N. J., is asking bids until June 4 for oil-burning equipment, boilers, etc. Guilbert & Betelle, Chamber of Commerce Building, Newark, are architects. Edmund Stevenson is secretary.

National Oil Products Co., Essex Street, Harrison, N. J., has plans for a

four-story addition, 60 x 85 ft., for refined oil production, storage and distribution, to cost over $45,000 with equipment. Bishop & Scudder, 9 Clinton Street, Newark, are architects and engineers.

Gulf Refining Co., Pittsburgh, has awarded contract to United Engineers & Constructors, Inc., for extensions to bulk storage plant on Staten Island, N. Y., to cost about $2,000,000.

New England

BOSTON, May 26.—A number of manufacturing plants have tentative plans for new equipment and are negotiating with dealers on prices, deliveries, etc., but there have been few actual sales. Sentiment among dealers is that some improvement will be noted before the end of June. The used tool market is steady, with 16 to 24-in. lathes and small drilling equipment the most active.

Small tool buying is holding up well, but manufacturers, as a rule, are well stocked and their plants are not operating at capacity. Prices for small tools are firm, and makers look for no change the remainder of the year.

The Navy Department, Washington, is taking bids until June 3 on twist, carbon and high-speed drills, delivered Boston Navy Yard; until June 10 on chain hoists, delivered Boston, and until June 10 on vises, delivered Portsmouth, N. H.

Lux Clock Mfg. Co., Waterbury, Conn., has awarded general contract for a three-story and basement addition, 32 x 80 ft.

City of Springfield, Mass., has plans for a three-story and basement repair shop and storage unit to cost $100,000 with equipment.

Otter River Foundry Co., Otter River, Mass., has plans for a new plant to replace that destroyed by fire May 22.

Bush Mfg. Co., Hartford, Conn., manufacturer of automobile radiators, will award general contract soon for a one-story plant, 80 x 120 ft.

Rabinowitz Mfg. Co., Providence, R. I., manufacturer of jewelry and novelties, has started work on a two-story addition, 40 x 57 ft. Bench equipment will be purchased.

Foxboro Co., Foxboro, Mass., manufacturer of gages, is erecting an addition to its plant.

Hartford Special Machinery Co., Hartford, Conn., has plans for an addition, but will not start work until late in the summer or fall.

Union Twist Drill Co., Athol, Mass., will soon award contract for plant improvements.

Noyes & Nutter Mfg. Co. and Wood & Bishop Co., Bangor, Me., stove manufacturers, have consolidated and will operate under Wood & Bishop Co. management. George H. Nutter, president of Noyes & Nutter Mfg. Co., will retire.

George I. Rockwood, president and treasurer of Rockwood Sprinkler Co., Worcester, Mass., has sold his large controlling interest to Gamewell Co., Newton Upper Falls, Mass., manufacturer of police and fire signal systems, and first named company will be merged with Gamewell Co. Mr. Rockwood, though retiring from active business, will be identified with company in a consulting capacity. The two plants will continue as separate units.

The Crane Market

NEW inquiry for locomotive cranes continues small. Contractors, who normally are active buyers of cranes and shovels, apparently believe that renting is more satisfactory than purchasing, especially at present with a limited number of contracts and periods of idleness. These rentals are made both from dealers and other contractors who have inactive equipment. The Finkelstein Foundry Supply Co., Vernon, Cal., has closed on a truck crane with the Orton Crane & Shovel Co.

A small volume of inquiry for overhead cranes is being received, but buying is small and no sizable lists of cranes are pending award. The Board of Transportation, New York, has an inquiry ready to be issued formally for about 25 cranes to be installed at the 207th Street yards of the new subway. The Illinois Steel Co., Chicago, has bought two 40-ton overhead cranes from an unnamed builder and the company is still in the market for at least 10 overhead cranes for its South works.

Norma-Hoffmann Bearings Corporation, Hamilton Street, Stamford, Conn., manufacturer of precision ball bearings, thrust bearings, etc., has awarded a general contract to Hewlett Co., 886 Main Street, Bridgeport, Conn., for one and two-story addition, 100 x 200 ft., to cost about $75,000 with equipment. Fletcher-Thompson, Inc., 542 Fairfield Avenue, Bridgeport, is architect and engineer.

Tide Water Oil Sales Corporation, 11 Broadway, New York, a subsidiary of Tide Water Oil Corporation, same address, has plans for new oil storage and distributing plant at Quaker Hill, near New London, Conn., to cost over $50,000 with equipment.

Maine Central Power Co., Augusta, Me., has work under way on hydroelectric generating plant on Kennebec River, near Bingham, to cost $10,000,000, including steel tower transmission system. Part of output will be used for service at new newsprint mill of Maine Seaboard Paper Corporation, Bucksport, Me., also under construction, an affiliated organization, to cost more than $3,500,000.

Chapman Valve Co., Indian Orchard, Mass., manufacturer of heavy gate valves, etc., has awarded general contract to Adams & Ruxton Construction Co., 1387 Main Street, Springfield, Mass., for one and two-story addition to foundry and valve shop, to cost about $50,000 with equipment. Company has acquired plant and business of Coffin Valve Co., Boston, with plant at Squantum, manufacturer of sluice gates, gate valves and kindred products, and will consolidate.

Brockton Mop Wringer Co., 146 Court Street, Brockton, Mass., has been sold to Market Forge Co., Everett, Mass., manufacturer of steel racks, trucks, stamped metal work, etc.

Buffalo

BUFFALO, May 26.—Bos-Hatten Co., 1316-18 Elk Street, Buffalo, manufacturer of sheet metal products, has filed plans for a one-story boiler and plate shop, to cost about $30,000 with equipment.

Clark Machinery Co., St. Johnsville, N. Y., is planning to rebuild part of plant recently destroyed by fire, with loss over $80,000 including equipment.

Griffiths & Palcott, Ogdensburg, N. Y., have plans for a two-story automobile service, repair and garage building, to cost about $100,000 with equipment.

Ford Motor Co., Dearborn, Mich., is said to have purchased property at or near Buffalo, comprising 42 acres at Lackawanna, near mill of Bethlehem Steel Co.; 29½ acres near elevator of Canadian Wheat Pool, and 240 acres on waterfront near Bayview. It is understood that first noted will be used as site for new plant to manufacture wire wheels, while second tract will be utilized for a salvaging and reclaiming mill, storage and distributing plant. Bayview site will be given over to an aircraft manufacturing plant, with landing and testing field. Entire project will cost over $2,500,000 with equipment.

Buffalo Bronze Die Cast Corporation, 90 Arthur Street, Buffalo, has taken out a permit for a one-story machine shop addition, to cost about $24,000 with equipment.

Solvay Process Co., Solvay, Syracuse, N. Y., manufacturer of soda ash, caustic soda, etc., has plans for expansion, including new pipe line from salt wells near Tully, N. Y., to Solvay, to be carried out by Tully Pipe Line Co. Entire project will cost over $1,750,000 with equipment. Company is a subsidiary of Allied Chemical & Dye Corporation, 61 Broadway, New York.

Merwin L. Todd, 22 Prospect Street, Utica, N. Y., and associates have organized Utica Skyways, Inc., with capital of $25,000, to operate local plant for manufacture of aircraft, including parts and assembling departments. G. Clayton Farrell, 112 Herkimer Road, is interested in new organization.

South Atlantic

BALTIMORE, May 26.—Washington Railway & Electric Co., Fourteenth and C Streets, Washington, has asked bids on general contract for two-story automobile service, repair and garage building, to cost about $375,000 with equipment. A. B. Heaton, 1211 Connecticut Avenue, is architect. Potomac Electric Power Co., an affiliated organization, will soon begin addition to steam-operated electric generating station at Bennings, near Washington, to cost over $450,000 with equipment. Stone & Webster Engineering Corporation, Boston, is architect and engineer.

Board of District Commissioners, District Building, Washington, will receive bids until June 9 for electric welding machine, until June 11 for one derrick, and until June 6 for 66 work benches, etc., for public schools. Board plans installation of manual training equipment in three-story Charles William Elliott Junior High School, for which general contract has been let to W. P. Rose Co., Wayne National Bank Building, Goldsboro, N. C., to cost $460,000. A. L. Harris, District Building, is municipal architect.

Danko Pattern & Mfg. Co., 31 East Lee Street, Baltimore, manufacturer of metal and wood patterns and other mechanical equipment, is planning new one-story plant, 50 x 100 ft., to cost over $35,000 with equipment.

Lindsay-McMillan Co., 93 South Water Street, Milwaukee, manufacturer of refined oils, industrial chemicals, etc., will rebuild part of branch plant at Savannah, Ga., recently destroyed by fire, at cost of about $30,000 including machinery;

copper-lined retorts and auxiliary equipment will be installed. Zeno Le Tellier, 747 West Fifty-second Street, Milwaukee, is architect and engineer.

Victor G. Bloede & Co., 703 Caton Avenue, Baltimore, manufacturers of industrial chemicals, etc., plans call for bids in June on general contract for two-story addition, to cost about $140,000 with machinery.

Georgia Power Co., Atlanta, Ga., is arranging for merger with Columbus Electric & Power Co., Columbus, Ga., and will carry out expansion, including new steel tower transmission line from Atlanta to new steam-electric generating plant in course of erection at Atkinson, Ga. Georgia company has concluded negotiations for acquisition of Georgia Hydro-Electric Co., with hydroelectric generating station on Towaliga River, near Griffin, Ga.

Gulf Refining Co., Frick Building, Pittsburgh, is planning oil storage and distributing plant at Lynchburg, Va., to cost about $35,000 with equipment.

Philadelphia

PHILADELPHIA, May 26.—West Philadelphia Stock Yard Co., Thirtieth and Race Streets, Philadelphia, has awarded general contract to Turner Construction Co., Seventeenth and Walnut Streets, for a six-story and basement meat-packing plant on Grays Ferry Avenue, including conveying and other mechanical-handling equipment, refrigerating machinery, etc., to cost about $1,000,000. Project will include an automobile service and garage building, and tank house. C. B. Comstock, 110 West Fortieth Street, New York, is architect and engineer.

Reading Co., Reading Terminal, Philadelphia, has authorized electrification of its branch line to Doylestown, Pa., to cost $300,000, and has arranged an appropriation in that sum, making total budget of $20,300,000 for electrification program in this district. Storage facilities, with inspection and repair departments, will be provided at Doylestown; also power substation. Company will build a large electric frequency changer station at Wayne Junction, near new electric car shops, to cost $4,000,000 with machinery.

National Patent Reed Co., Unionville, Conn., has leased 25,000 sq. ft. in Folwell Mills, Third and Somerset Streets, Philadelphia, for new plant.

Lit Brothers, department store, Eighth and Market Streets, Philadelphia, has awarded general contract to William Linker Co., 735 Cherry Street, for power plant, 80 x 127 ft., to cost about $200,000 with equipment. Simon & Simon, Fidelity Building, are architects.

Public Service Electric & Gas Co., Terminal Building, Newark, N. J., has purchased property at Burlington, N. J., as site for new steam-operated electric generating plant, representing total investment of more than $25,000,000 with transmission system. Company has recently purchased about 38 acres in Pensauken Township, Camden County, for a large power switching and substation, to cost over $750,000 with equipment.

Thomas-Thiel, Inc., Vandever Avenue, Wilmington, Del., operating a metal-plating works, is establishing a new department for cadmium plating.

Madeira, Hill & Co., Broad and Spruce Streets, Philadelphia, coal miners, have plans for a new central coal breaker at Frackville, Pa., to cost over $100,000 with machinery.

Harvey Weisel, Milford Square, Pa., plans rebuilding part of machine shop recently destroyed by fire.

Silent Automatic Sales Corporation, 120 Witherell Street, Detroit, manufacturer of oil burners and oil burning equipment, has leased one-story building at 1976-88 Hunting Park Avenue, Philadelphia, 95 x 260 ft., and will remodel for factory service branch and distrbuting plant.

De Walt Products Corporation, manufacturer of high-speed cutting equipment, is occupying largest building of Rowe manufacturing plant at Lancaster, Pa., affording 30,000 sq. ft. of floor space all on one floor. Paul Gardner is president.

Milwaukee

MILWAUKEE, May 26.—Buyers of machine tools are still reluctant to place orders and, although a moderate volume of business is passing, the past week has witnessed increasing difficulties in closing inquiries, some of which date back three to four months. Replacements still dominate the market. Production schedules are holding their own fairly well, but unless new bookings increase, a decline will occur.

Lakeside Bridge & Steel Co., Milwaukee, for 17 years engaged in production of fabricated structural steel, is entering field of industrial machinery, following several years of development work in this direction. New lines include cranes, derricks, drilling equipment, etc. Some production equipment is being added. Samuel C. Coddington is president.

Garton Toy Co., Sheboygan, Wis., manufacturer of metal and wood products, is planning expansion, with investment of about $100,000 in building and equipment. Line of steel and wood coaster wagons, velocipedes, sleds, juvenile furniture, etc., will be enlarged to include greater assortment of outdoor playground equipment, all-steel construction toys and airplanes. Present force of 450 will be increased to about 600 upon completion of addition.

Tobin Tool & Die Co., 160 South Brook Street, Fond du Lac, Wis., which is building a one-story addition, 50 ft. sq., has placed order with an Eastern manufacturer for five automatic screw machines and will engage in production of standard screws and specialties as addition to present lines.

Beaver Dam Pattern Co., Beaver Dam, Wis., occupying leased quarters, has placed contracts for erection of first unit, 40 x 100 ft., of new plant, to be ready July 1. Initial investment will be about $25,000.

J. M. Nash Co., 842 Thirtieth Street, Milwaukee, manufacturer of woodworking machinery and tools, is awarding contracts for a two-story addition, 30 x 120 ft., costing about $30,000 with equipment.

Common Council of Wauwatosa has authorized board of public works to advertise for bids for furnishing water department two 1000-gal. centrifugal pumps and one deep well turbine for new artesian well just completed. Board also has placed contract for 1,000,000-gal. ground level steel water storage tank.

Jambor Tool & Stamping Co., 1261 Thirtieth Street, Milwaukee, has started work on a two-story shop extension, 45 x 60 ft., costing about $30,000.

Cincinnati

CINCINNATI, May 26.—Single orders for lathes and cutter grinders continue in fair volume. Demand for planers, radial drills and other standard machine tools is spotty. Inquiry is good although buyers are deferring action on the quotations. Production is steady, but at much less than capacity, and no change has been noted this month.

Amtorg Trading Corporation, New York, has purchased one cutter grinder from a local manufacturer, the first purchase in this district by this company in several months.

Brown-Brockmeyer Co., Inc., Norwood, Avenue, Dayton, Ohio, manufacturer of fractional horsepower motors, controls, etc., has plans for new one-story plant, to cost about $100,000 with machinery. It is proposed to begin work in about 60 days.

Val Decker Packing Co., Piqua, Ohio, meat-packer, has awarded general contract to Green & Sawyer, Inc., Lima, Ohio, for three-story addition, 120 x 190 ft., to cost over $100,000 with equipment, including conveying and other mechanical-handling equipment, refrigerating machinery, etc. Anders & Reimers, Erie Building, Cleveland, are architects.

Tennessee Natural Gas Corporation, 502 Houston Street, Chattanooga, Tenn., is considering early installation of pipe line from properties in Sunbright oilfields to Chattanooga and vicinity, to cost over $200,000.

Stanley Rule & Level Co., New Britain, Conn., has acquired equipment and business of Cummins Mfg. Co., Fayetteville, Tenn., manufacturer of kindred precision apparatus, and leased local plant of that company for factory branch for production of gasoline gages, rules, yardsticks, etc. Company has also acquired equipment of Bryson Mfg. & Printing Co., Fayetteville, and will use at local plant. W. G. Cowan will be manager of new branch.

Duriron Co., North Findlay Street, Dayton, Ohio, manufacturer of alloy castings, etc., has awarded general contract to H. R. Blagg Co., 1229 East Third Street, for one-story foundry, 64 x 80 ft., to cost about $25,000 with equipment. Geyer & Neuffer, Ludlow Arcade Building, are architects.

Union Gas & Electric Co., Fourth and Plum Streets, Cincinnati, is planning new steam-operated electric generating plant, to cost over $1,000,000 with transmission lines. Company engineering department is in charge.

Board of Education, Chattanooga, Tenn., has been authorized by Hamilton County Court to carry out expansion program at Bonny Oaks Industrial School, to cost $111,900, including buildings and equipment. R. H. Hunt Co., James Building, is architect.

Amrad Corporation, Medford Hills, Mass., operated by Crosley Radio Corporation, Cincinnati, has been merged with Magnavox Co., Emeryville, Cal., manufacturer of radio equipment, loud speakers, etc. Headquarters of consolidated company, which will be known as Magnavox, Ltd., will be maintained in future at Cincinnati. Crosley company has recently taken over radio receiver manufacturing branch of Amrad Corporation, and it is understood that Medford Hills plant will be discontinued. Magnavox plant at Emeryville will be main-

tained at present location and output increased.

D. A. Ebinger Sanitary Mfg. Co., 403 West Town Street, Columbus, Ohio, has awarded general contract to E. Elford & Son, 555 South Front Street, for a one-story foundry addition.

Ross-Willoughby Co., machinery and supplies, Springfield, Ohio, has moved to 1310 West Main Street.

Chicago

CHICAGO, May 26.—Conditions in this market appear mixed. Dealers who are depending on scattered orders are finding business dull with May sales below the rate in April. Sellers who have been participating in orders from the Nash Motors Co., Milwaukee, and the Majestic Household Utilities Corporation, a subsidiary of the Grigsby-Grunow Co., Chicago, find total sales so far this month fully equal to the aggregate for May last year. The Grigsby-Grunow Co. placed one order for presses valued at close to $1,000,000, and is now ordering tool room equipment and miscellaneous machines that do not form part of production line equipment.

Caterpillar Tractor Co., Peoria, Ill., is still working on plans for an extensive list. The Milwaukee Road is said to have decided on where it will buy the machines on its car shop list, but formal orders have not been placed. The Rock Island has purchased a car wheel lathe. The used equipment market is moving slowly with little being offered in the way of good tools. Purchases against the list for the Austin High School may not be made until late in June.

Peoples Gas, Light & Coke Co., 122 South Michigan Avenue, Chicago, will build a one-story shop and service building, 40 x 95 ft., to cost $42,000. R. Schenck, 122 South Michigan Avenue, is architect.

Mills Novelty Co., 4110 Fullerton Avenue, Chicago, will build a tool shop, 117 x 108 ft., to cost $22,000. M. L. Kantoier, 3247 Fulton Street, is architect.

Illinois Bell Telephone Co., 212 West Washington Street, Chicago, has asked bids on general contract for a one-story equipment storage and distributing plant, with automobile service and garage facilities, at Rockford, Ill., to cost about $75,000 with equipment. Dyer & Madherny, 38 South Dearborn Street, Chicago, are architects.

Reichel & Drews, 452 North Ashland Avenue, Chicago, machinists, have awarded a general contract to H. N. Samuel, 53 West Jackson Boulevard, for a one-story machine shop addition, 25 x 75 ft. J. M. Brandstetter, 2001 West Pershing Road, is architect.

Munson Steel & Tube Co., 1550 West Forty-fourth Street, Chicago, has leased about 10,000 sq. ft. of floor space at Seventy-fourth Street and Ashland Avenue for new plant and will remove to new location and increase capacity.

Rocky Mountain Power Co., Butte, Mont., a subsidiary of Montana Power Co., same address, will construct and operate a hydroelectric generating plant at Flathead Lake in Flathead Indian Reservation, Montana, to cost over $5,000,000 with transmission system.

Josten Mfg. Co., Owatonna, Minn., manufacturer of jewelry specialties, plated ware, etc., has work under way on a new one-story plant, to cost about $50,000 with equipment.

Watson Orchards, Inc., Neoga, Ill., with main offices at 236 North Clark Street, Chicago, R. A. Watson, manager, is considering construction of two-story cold storage and refrigerating plant at Neoga, to cost over $100,000 with equipment.

Ellerbe & Co., Minnesota Building, St. Paul, Minn., architects, have awarded a general contract to Lovering-Longbotham Co., Builders' Exchange, for a five-story automobile service, repair and garage building, to cost about $375,000 with equipment.

City Council, Elk Point, S. D., is planning early construction of an addition to municipal electric light and power plant, including installation of new equipment.

Northern Pacific Railway Co., Railroad Building, St. Paul, Minn., has taken bids on general contract for a one-story machine shop addition at Glendive, Mont., to cost about $30,000 with equipment. O. M. Rognan, address noted, is company architect.

Kewanee, Ill., works of Walworth Co. will begin erection of a two-story factory adjoining its gray iron plant for production of valves and parts. J. E. Kemp, superintendent of maintenance at plant, will be in charge of construction.

Pittsburgh

PITTSBURGH, May 26.—Machine tool orders the past week have been quite heavy, largely because of the placing of considerable business by the American Bridge Co. for its Ambridge, Pa., plant. Most of this company's inquiry has now been acted against and no other large general inquiries are before the trade. The usual number of small orders has been entered, but new inquiry is rather backward. However, the aggregate amount of new business before the trade is in fair volume.

Sales of local dealers thus far in the month compare favorably with April, a number reporting slight gains. Comparisons with the corresponding period last year show declines of 20 to 50 per cent, but 1929 was a particularly good machine tool year.

Elliott Co., Ridgway, Pa., manufacturer of high pressure heaters and other steam power specialties, has plans for a one-story addition, 140 x 220 ft., to cost about $200,000 with equipment. Headquarters are in Frick Building, Pittsburgh.

Duquesne Gas Co., Pittsburgh, has arranged for sale of common stock, totaling $4,650,000, part of proceeds to be used for expansion and improvements in natural gas properties in western Pennsylvania, including pipe lines, compressor stations, etc.

West Virginia Machine Co., Charleston, W. Va., recently organized by W. E. Gilkesin, 113 Oakhurst Street, Bluefield, W. Va., and associates, with capital of $25,000, is planning for operation of a machine shop.

Fostoria Glass Co., Moundsville, W. Va., has awarded general contract to Carl W. Shimp, Hawley Building, Wheeling, W. Va., for an addition, to cost about $100,000 with machinery. Lockwood Greene Engineers, Inc., 100 East Forty-second Street, New York, is architect and engineer.

Board of Trustees, Mellon Institute of Industrial Research, Parkman Boulevard, Pittsburgh, has plans for a seven-story mechanical, electrochemical and chemical laboratory, 300 x 400 ft., for expansion in all research activities, to cost over $400,000 with equipment. It is understood that general contract has been let to Mellon-Stuart Co., Oliver Building; Janssen & Cocken, Century Building, are architects.

Indiana

INDIANAPOLIS, May 26.—Louisville & Nashville Railroad Co., Ninth Street and Broadway, Louisville, will take bids early in June for power plant at Howell, Ind., to cost about $35,000 with equipment. J. C. Hally is company architect.

Emge Packing Co., Fort Branch, meatpacker, has awarded general contract to Kanzler & Son, Furniture Building, Evansville, for four-story and basement addition, 50 x 60 ft., to cost about $80,000 with conveying and other mechanical-handling equipment.

Atlas Box Co., 932 East Pennsylvania Street, Evansville, manufacturer of corrugated paperboard and fiber boxes and containers, has asked bids on general contract for two-story addition, 52 x 65 ft., to cost about $40,000 with equipment. Alfred E. Neucks, Old National Bank Building, is architect.

Board of School Trustees, Gary, is planning installation of manual training equipment in new three-story high school to cost $1,000,000, for which bids will be asked on general contract early in June. William B. Ittner, 911 Locust Street, St. Louis, is architect.

Board of Public Works, Garrett, has awarded general contract to William A. Sheets Construction Co., Cal-Wayne Building, Fort Wayne, for three-story and basement addition to municipal electric light and power plant, 45 x 70 ft., to cost over $60,000 with equipment. A. M. Strauss, Cal-Wayne Building, Fort Wayne, is architect.

Officials of Peerless Wire Goods Co., Inc., Lafayette, have arranged for reorganization of company, with increased capital of $200,000, equally divided in preferred and common stock. Expansion in operations will be carried out. Ernest H. Schilling and Edwin R. Clegg are heads.

Detroit

DETROIT, May 26.—Hart & Cooley Mfg. Co., East Eighth Street, Holland, Mich., manufacturer of draft regulators, chains, etc., is considering one-story addition to foundry, to cost about $30,000 with equipment.

Electrograph Co., 725 West Grand Boulevard, Detroit, manufacturer of electric recording devices and equipment, has awarded general contract to Christman-Burke Co., Fisher Building, for new plant unit, to cost over $60,000 with equipment. Weston & Ellington, Stroh Building, are architects.

Ex-Cell-O Aircraft & Tool Corporation, 1200 Oakman Street, Detroit, manufacturer of aircraft equipment, tools, etc., has acquired Continental Tool Works, Inc., 5835 Martin Street, manufacturer of small precision tools, including taps, milling cutters, etc., and will consolidate. It is understood that acquired company will continue at present plant, which provides about 50,000 sq. ft. floor space.

International Box Corporation, 6460 East Jefferson Street, Detroit, recently organized with capital of 5000 shares of stock, no par value, plans early operation of local plant for production of special bolted collapsible boxes for automobile packing for export trade. Mehmed S. Zia is president and treasurer; Alfred T. Shippstead is vice-president.

American Enameled Magnetic Wire Co., Muskegon, Mich., a subsidiary of Electric Auto-Lite Co., Toledo, Ohio, has taken over former plant of Port Huron Engine & Thresher Co., Port Huron. It is planned to remove Muskegon works to new location, providing additional equipment for increased production.

Board of Education, Hastings, Mich., is considering installation of manual training equipment in new senior high school to cost $200,000, for which bids have been asked on general contract. W. S. Holmes Co., Capitol Savings and Loan Building, Lansing, is architect.

Ford Motor Co., Dearborn, has plans for extensions and improvements in local sheet glass manufacturing plant, to cost over $100,000. Giffels & Vallet, Marquette Building, Detroit, are architects.

Copper District Power Co., Whitehall, recently organized, affiliated with Middle West Utilities Co., 72 West Adams Street, Chicago, has acquired power properties of Northern Acquisition Co., in Ontonagon County, and Ontonagon Public Service Co., in same section, and will consolidate. Work will proceed on a hydroelectric power project on Ontonagon River, near Victoria, originally an enterprise of Northern Acquisition Co., to cost over $1,000,000 with transmission lines. Copper Range Mining Co., Ontonagon, with headquarters at 82 Devonshire Street, Boston, is also interested in power organization. Martin J. Insull of Middle West Utilities Co., is president.

St. Louis

ST. LOUIS, May 26.—Board of Education, Board of Education Building, St. Louis, will soon take bids on general contract for four-story and basement vocational shop building, 100 x 150 ft., to cost over $400,000 with equipment. Bids will also be asked at early date for a one-story power plant, 70 x 150 ft., to cost about $100,000 with equipment. George W. Sanger is acting commissioner of schools.

Packard Motor Car Co., 201 West Tenth Street, Oklahoma City, Okla., has plans for a two-story service, repair and sales building, 100 x 190 ft., to cost about $100,000 with equipment. Joseph I. Davis, First National Bank Building, is architect.

L. C. Wilderman Lubricating Co., 1929 North Kingshighway, St. Louis, lubricating oils, greases, etc., has leased for new works two and one-half story plant, 110 x 130 ft., to be erected at Franklin Avenue and Seventh Street, to cost over $100,000.

Kansas Gas & Electric Co., Wichita, Kan., is arranging for a bond issue to total $16,000,000, part of proceeds to be used for expansion and betterments.

Board of Education, District No. 2, Trousdale, Kan., has plans for a one-story and basement vocational school, 45 x 65 ft., to cost about $40,000 with equipment. Smith & English, Nelson Building, Hutchinson, Kan., are architects.

Oklahoma Gas & Electric Co., Oklahoma City, Okla., is planning two-story equipment storage and distributing plant, to cost about $50,000.

Board of Trustees, Washington University, St. Louis, has plans for new three-story engineering building, for mechanical, electrical and other engineering service, to cost about $350,000 with equipment. Jamieson & Spearl, Arcade Building, are architects.

Albert Glauser, 2130 Market Street, St. Louis, meat packer, is considering new one-story meat-packing plant, to cost about $50,000 with mechanical-handling, conveying and other equipment.

Central Kansas Power Co., Abilene, Kan., will proceed with addition to steam-operated electric power plant at Hoxie, Kan., 25 x 45 ft., to cost about $60,000 with equipment. W. J. Murray, United Building, Abilene, is architect.

City Light & Traction Co., operated by Cities Service Gas Co., Bartlesville, Okla., is considering construction of pipe line to Sedalia, Mo., and vicinity for natural gas service, to cost over $150,000 with compressor stations.

Pittsburgh Plate Glass Co., Frick Building, Pittsburgh, has plans for a one-story factory branch, storage and distributing plant at Kansas City, Mo., 160 x 350 ft., to cost over $100,000 with equipment. W. R. Bovard, Orear-Leslie Building, is architect; Frank L. Brown, address last noted, is engineer.

Gulf States

BIRMINGHAM, May 26.—Gulf Refining Co., Fort Worth, Tex., is considering addition to local oil refinery, to cost about $200,000 with machinery.

Texas Potash Corporation, Republic Bank Building, Dallas, Tex., has plans for potash mining and refining plant in Midland County, to cost over $1,000,000 with machinery. Project will include a power house and machine shop.

Emery, Peck & Rockwood Co., 208 South La Salle Street, Chicago, investment securities, is at head of project to construct and operate a series of hydroelectric generating plants on Colorado River in Texas. Permission has been received to construct five power dams, one near Kingsland, Tex., two in Burnet County, and two in Travis County. Project will include steel tower transmission lines, and will cost over $7,500,000.

Texas-Oklahoma Wheat Growers' Association, Perryton, Tex., has plans for new elevator, to cost over $90,000 with elevating, conveying, screening and other equipment.

National Power & Light Co., Houston, Tex., operating Houston Lighting & Power Co., Houston; Birmingham Electric Co., Birmingham, and other light and power properties, has arranged for a bond issue of $15,000,000, part of fund to be used for extensions and improvements in power plants and systems.

Board of Trustees, Alabama Polytechnic Institute, Auburn, Ala., has awarded general contract to W. L. Coston & Son, Bessemer, Ala., for new two-story and basement engineering building, 60 x 300 ft., to cost about $200,000 with equipment. Warren, Knight & Davis, Protective Life Building, Birmingham, are architects.

Traveling ovens, power equipment, conveying and other machinery will be installed in new plant to be constructed by Valley Baking Co., Harlingen, Tex., to cost about $250,000 with equipment.

City and County Boards of Commissioners, Florence, Ala., have leased property on Chisholm Highway for city-county airport, including erection of hangars, repair shop and other field units, to cost over $70,000 with equipment.

Pasotex Petroleum Co., El Paso, Tex., has expansion program under way at local refinery, to cost more than $1,000,000. Considerable additional machinery will be installed.

Associated Gas & Electric System, 61 Broadway, New York, and Dallas, Tex., has purchased properties of Southern Ice & Utilities Co., Dallas, serving a group of about 300 municipalities in southwest section. Company plans expansion in artificial ice plants, light and power properties.

American Solvents & Chemical Corporation, 122 East Forty-second Street, New York, with main plants at New Orleans and Harvey, La., has arranged for a merger with Rossville Commercial Alcohol Corporation, Graybar Building, New York, with plants near New Orleans, and General Industrial Alcohol Corporation, with plants at New Orleans and Marrero, La. Consolidated organization plans plant concentration and improvements for larger output. H. I. Peffer, heretofore president of American Solvents company, will be chairman of board of new organization; V. M. O'Shaughnessy, president of Rossville company, will be president of consolidated company.

Cleveland

CLEVELAND, May 26.—Machine tool business continues slow with little change in the volume of sales. Most orders are for single machines. The Yoder Co., Cleveland, the past week purchased eight or 10 machines, including two planers, three lathes and two boring mills. The Youngstown Sheet & Tube Co. bought some equipment for its tube and pipe mill. Republic Steel Corporation is understood to have concluded the purchase of equipment for its machine shop in connection with its new pipe plant. Very little business is coming from the automotive industry.

Lamson & Sessions Co., 1971 West Eighty-fifth Street, Cleveland, manufacturer of bolts, nuts, etc., has asked bids on general contract for one-story addition, to cost about $40,000 with equipment. George S. Rider Co., Marshall Building, is architect and engineer.

National Machine Co., Tiffin, Ohio, has plans for two-story addition, 80 x 100 ft., to cost over $50,000 with equipment. George Netcher, Tiffin, is architect.

E. F. Hauserman Co., 6800 Grant Avenue, Cleveland, manufacturer of steel factory partitions, office fixtures, etc., has plans for two-story and basement addition, 80 x 270 ft., to cost about $125,000 with equipment. George S. Rider Co., Marshall Building, is architect and engineer.

Firestone Tire & Rubber Co., Akron, Ohio, will soon take bids for two-story factory branch and distributing plant at Toledo, Ohio, to cost about $100,000 with equipment.

F. E. Myers & Brothers Co., Church Street, Ashland, Ohio, manufacturer of pumps, waterworks machinery, etc., has approved increase in capital from 200,000 to 300,000 shares of stock, no par value, part of fund to be used for expansion.

Board of Education, Central High School Building, Akron, Ohio, is planning installation of manual training equipment in new J. R. Buchel High School, to cost $500,000, for which bids will soon be asked on general contract. M. M. Konarski is architect for board, address noted.

Patterson Foundry & Machine Co., East Liverpool, Ohio, will start immediate construction of a steel foundry at East Liverpool, Ohio, which is expected

to be in operation by July 1. Company will also erect a large power plant.

American Mono Rail Co., Cleveland, has added 3000 sq. ft. of floor space to its plant for expansion.

Canada

TORONTO, May 26.—Public Utilities Commission, C. C. Folger, Kingston, manager, will soon call for bids for a 7,000,000-gal. per day centrifugal pump and synchronous motor pump for city of Kingston, Ont. It is also proposed to purchase a new Diesel engine operated by crude oil.

A sewage disposal plant will be installed at Kitchener, Ont., to cost $357,000, bids to close June 15. Tenders will be in two sections, for construction of plant and for supplying equipment. E. Shupe is engineer; Gore, Nasmith & Storrie, Confederation Life Building, Toronto, consulting engineer.

Bids will be called soon by Catto & Catto, architects, 1 Wellington Street East, Toronto, for alterations and addition to plant of the James Morrison Brass Mfg. Co., Ltd., 93 Adelaide Street West, to cost $175,000.

W. H. Cooper, 42 James Street North, Hamilton, Ont., has general contract for a four-story addition for B. Greening Wire Co., Ltd., Queen Street North. B. H. & Fred Prack, Pigott Building, are architects.

Canadian Copper Refiners, Ltd., has awarded excavation contract to Kendall Brothers, Ltd., 1853 Iberville Street, Montreal, in connection with erection of a $2,000,000 refinery in East Montreal.

Galbraiths' Ltd., New Westminster, B. C., will start work immediately on a sawmill on Lulu Island, to cost $250,000.

Pacific Coast

SAN FRANCISCO, May 22.—Ford Motor Co., Dearborn, Mich., will soon take bids on general contract for new assembling plant at Richmond, Cal., consisting of main one-story unit, two-story storage and distributing building, power house and other structures, to cost $2,500,000 with machinery. Company engineering department, Dearborn, is in charge.

Grand Rapids Store Equipment Co., Grand Rapids, Mich., manufacturer of store fixtures, etc., has plans for new plant on 8-acre tract recently purchased at South Gate, near Los Angeles, to cost over $350,000 with machinery.

Board of Trustees, University of Santa Clara, Santa Clara, Cal., has awarded general contract to H. C. Miller, Stevens Creek Road, Santa Clara, for construction of one-story top addition to Montgomery shop unit, 50 x 180 ft., to cost over $40,000 with equipment.

Municipal Light Department, Pasadena, Cal., R. V. Orbison, city manager, is planning an addition to municipal electric light and power plant, to cost close to $1,000,000, of which about $100,000 will be expended for building adjoining present station, and remainder for machinery, including additional generating unit.

Pacific States Cast Iron Pipe Co., Ironton, Utah, has plans for one-story addition, to cost about $50,000 with equipment.

Board of Education, Seattle, contemplates installation of manual training equipment in three-story addition to Lincoln High School, to cost $300,000. F. A. Naramore, 810 Dexter Avenue, is architect.

Caldow Paint Co., 1422 Fourteenth Street, Oakland, Cal., has awarded general contract to Villadsen Brothers, 461 Market Street, San Francisco, for three-story and basement addition, to cost about $40,000. Part of unit will be used for storage and distribution. C. W. McCall, 1404 Franklin Street, Oakland, is architect.

Western Board Products Co., Salem, Ore., has plans for a new one and one-half story plant, 60 x 170 ft., to manufacture corrugated paperboard and kindred products, to cost about $35,000 with machinery. A. A. Siewert, Center and Winter Streets, Salem, is architect.

Vernon Foundry Co., Hollydale, Cal., has transferred to Baash-Ross Tool Co., 5512 South Boyle Avenue, Los Angeles, manufacture and sale of Vernon power presses and shears. Limited facilities of Vernon plant, it is stated, make it impossible for company to supply many types of machines for which there is a growing demand on Pacific Coast. Baash-Ross Tool Co. will produce these machines on a larger scale than had been possible in Vernon plant.

For third time within a year manufacturing plant of United States Electrical Mfg. Co., Los Angeles, is being enlarged, adding about 25 per cent more floor space. About four months ago factory was increased 50 per cent by addition of a side wing and a new manufacturing unit. Company reports a substantial increase in business since first of January and is employing two shifts. It specializes in production of asbestos-protected autostart motors ranging up to 150 hp.

Foreign

PLANS are under way by Tampico Salt Refining Co., Tampico, Mexico, for plant to cost over $400,000. Project will include power station and pumping station, latter to be used for pumping water from Gulf of Mexico and which will be evaporated artificially.

Swedish Match Co., Stockholm, Sweden, is considering early erection of two large plants in Australia, one near Sydney, to cost over $1,000,000 with machinery. Company is operated by Kreuger & Toll Co., Stockholm.

I. B. Kleinert Rubber Co., 485 Fifth Avenue, New York, with main plant at College Point, L. I., has purchased plant and business of Masonia Rubber Works, Hamburg, Germany, producer of sponge rubber goods, etc., for another foreign branch. Expansion in output is planned.

George Lee Miller, Canton, Ohio, formerly vice-president and general manager of Gilliam Mfg. Co., Canton, manufacturer of roller bearings, acquired a few years ago by Timken Roller Bearing Co., Canton, is closing negotiations with Soviet Russian Government, Moscow, to organize a similar industry at last-noted place. It is proposed to purchase machinery in United States and assemble a working organization to carry out initial operations at plant, where Soviet Union will employ native workmen. Plant will be used primarily for production of roller bearings for automobiles and tractors, to cost over $1,000,000 with equipment. It is scheduled to be ready for production in April, 1931.

Societe des Tuyaux Bonna, Paris, France, manufacturer of cast iron pipe, is considering establishment of branch foundry and plant at Montreal, to cost over $200,000 with equipment. Company is now operating branches in about 10 different cities in Europe, as well as in South Africa.

New Trade Publications

Engineering and Contracting Work.—Arthur G. McKee & Co., Cleveland. Booklet of 27 pages, attractively illustrated, devoted to the history of the company, and describing in detail the type of work carried forward by it.

Steam Heating Units.—American Blower Corporation, Detroit. Bulletin 9218-B-5M of 24 pages, illustrating and describing Venturafin heating units, in various sizes, for floor, wall or ceiling mounting.

Engines and Boilers.—James Leffel & Co., Springfield, Ohio. Bulletin 216, illustrating and describing, in 24 pages, Leffel Scotch marine-type portable boilers, designed to produce steam for any purpose in units of from 6 to 200 hp. Tables of sizes and specifications are included.

Small Motors.—Reliance Electric & Engineering Co., Cleveland. Bulletin 108 of four pages, illustrating and describing installation and application of small ball-bearing motors for two and three-phase alternating-current circuits, built for 7½ to 30 hp.

Blow Guns and Forge Blowers.—Schutte & Koerting Co., Philadelphia. Folder of four pages, illustrating and describing the advantages and applications of SK economy blow guns, for use in machine shops particularly. Prices and dimensions are given.

Oil Regulating Valves.—Hauck Mfg. Co., Brooklyn. Sheet 701, illustrating and describing micro-vernier oil regulating valve for use with any grade of fuel oil at all operating pressures, and furnished in four sizes.

Fire Brick.—A. P. Green Fire Brick Co., Mexico, Mo. Eighteen-page booklet, illustrating and describing new complete tunnel kiln unit used by the company in finishing its product.

Hydraulic Pump.—Index Machinery Corporation, 49 Central Avenue, Cincinnati. Illustrated 4-page circular describing the new Bussman hydraulic pump, of German manufacture, especially applicable to Bakelite molding and hydraulic straightening presses.

Die-Head.—Rickert-Shafer Co., Erie, Pa. Four-page folder describing and illustrating model "C" automatic self-opening die-head for use on automatic screw machines and chucking machines.

Motor-Generator Sets.—Reliance Electric & Engineering Co., Cleveland. Bulletin 500 of seven pages illustrates and describes various types of two and three-phase motor-generator sets for converting alternating current to direct current.

Portable Power Units and Induction Motors.—Century Electric Co., 1806 Pine Street, St. Louis. Bulletin 14-1000 of four pages deals with portable power units for farm application, and Bulletin 13-1 illustrates and describes multi-speed, squirrel-cage induction polyphase motors, operated by push-button, float or drum-switch control. Rating ranges from ⅛ to 150 hp.

The Week's News Quickly Told

Current Events That Bear on the Course of Business

TRADE, both wholesale and retail, is getting neither better nor worse, according to trade journals . . . Secretary of Commerce Lamont says that whereas 22 per cent of reporting stores reported that business in April was "good to excellent," 51 per cent made a similar statement in May. He estimates that the average commercial and industrial condition is six points subnormal.

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GRAIN markets, except rye, are higher, chiefly because of low stocks in Europe and pessimistic reports on world crop conditions . . . Prices of rye suffered from the dumping of 35,000 tons of Russian grain into Germany.

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EXPORT and import trade has fallen to the low point of five years . . . Poor crops in Argentine Republic have reduced her export of wheat, meat and hides 29 per cent below corresponding months in 1929, and this in turn has reduced by half her imports from the United States.

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INDUSTRIALISTS are expressing fears that the proposed tariff rates will unduly restrict foreign trade . . . Dr. Robert Welti, head of the group of Swiss economists and business men said, "for the first time since the war, a real feeling against the United States is being created in Europe by the prospect of tariffs so high as to effectually close the frontiers" . . . J. D. Mooney, president General Motors Export Co. believes that American exports of automotive and machine products will be especially curtailed . . . Leaders of the Conservative party in England are campaigning for a protective tariff on many lines of manufactured goods, with taxes on imported foods.

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CAR loadings are still about 10 per cent below corresponding weeks in 1929 . . . Baltimore & Ohio Railroad is authorized to acquire the Buffalo & Susquehanna Railroad for a link in a new short line, New York to Chicago, via Reading trackage, and connecting with the B. & O. main line at Butler, Pa. . . . Port of New York Authority acquires an entire city block for the first of three "inland freight terminals," where all railroads entering the metropolitan area will deliver less-than-carload freight for reassembly to individual destinations, and vice versa.

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EMPLOYMENT in the building trades is markedly improved, according to United States Department of Labor. Other lines show relatively little change in the April reports . . . Fifteen per cent of the workpeople in Great Britain are unemployed, the total being 1,739,500 or half again as many as last year . . . Theodore Roosevelt, Governor of Porto Rico, asks Congress for $3,000,000 for belated hurricane relief and emergency hospitals. Of the 1,500,000 inhabitants, 40,000 are tubercular, and 60 per cent of the children undernourished.

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MACHINERY orders unfilled at Allis-Chalmers plants as of April 30 total $17,000,000, a new high . . . April automobile production, while nearly quadruple that of last December, barely topped the figure for April, 1926 . . . New York Shipbuilding Corporation contracts to build two 30,000-ton, 20-knot passenger ships for the Atlantic trade—the largest ever built in America . . . Warren Brothers contract with the Peruvian government to build a $12,000,000 highway.

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MAIL order houses quote prices in their summer catalogs about 10 per cent lower than in the last editions . . . Sales by chain and mail order stores are up two per cent during first four months of 1930 as compared with January through April 1929 . . . Ready-cut meat markets, or "butcherterias" open in New York, with rugs on floors and saleladies vending fresh meats, packaged at the slaughter houses. Prices per pound are two or three cents lower than loose meat of corresponding cuts, due to savings in trimmings and by-products . . . Philip Le Boutillier, president National Retail Dry Goods Association, says that declining department store profits are caused by the excessive advertising of low prices in order to obtain sales volume.

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GENERAL Aviation Corporation, a counterpart of General Motors Corporation, is organized by the latter, and will have as subsidiaries Fokker, Bendix, Dornier and its other aviation units . . . Stimson Aircraft, which made 120 planes in 1929, delivered 35 to individual purchasers in April, and will produce 90 in May . . . Selfridge's, the London department store, holds a "sale" on single seater planes for $2,800, guaranteed to do 20 miles on a gallon of gasoline . . . Amy Johnson, an obscure English flyer, makes an unheralded solo flight from London to Port Darwin, Australia . . . Graf Zeppelin crosses the equator in a voyage to Rio de Janeiro.

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TELEVISION in conjunction with radio broadcast is demonstrated before theater audiences by Dr. Alexanderson of the General Electric research laboratories. A screen 6 by 7 ft. in area presented "close-ups" of the distant actors . . . Demand for specially trained men in the radio industry is such that Radio Corporation of America is opening five new schools for special instruction, practically doubling the existing facilities . . . Siemens & Halske of Germany and Ericsson Telephone Co. of Sweden have joined forces against the principal competitor for European business, the International Telephone & Telegraph Co., and have acquired a concession to finance and operate the telephone system in Greece.

Foundry Orders in April Gained, Production Off

New business received by gray iron foundries during April showed a slight upward trend, but production fell off a little as compared with March, according to the monthly report of the Gray Iron Institute. Reports from 150 foundries showed that they produced 28,731 tons of castings during April, as compared with a normal production of 31,672 tons. Production during the month, as compared with normal production, was 90.7 per cent. March was on the basis of 92.8 per cent. In April, last year, the percentage was 133.1 per cent. New business received during the month by 82 foundries indicated a percentage of 78.6 per cent, as compared with 78 per cent in March. Unfilled orders April 30, based on reports from 79 foundries, were 56.4 per cent, as compared with 55.9 per cent March 31. Under business outlook 124 foundries reported. Of these six found business good, 76 fair, 37 poor and 5 bad.

An analysis of the reports by districts showed that foundries in the Western district, including Wisconsin, Illinois and all territory west of the Mississippi River, did better than those in other sections. Tabulated reports of 55 foundries in the Western district showed that they were operating at a production ratio of 102.2 per cent to normal production.

The Eastern district, including New England States, New York, New Jersey and Canada, made the poorest showing, 38 foundries reporting a production of 80.5 per cent as compared with normal. Classifying foundries by capacities, those with a normal production of 100 tons a month or less showed the most activity, these operating at 96.7 per cent of normal capacity. Foundries producing over 400 tons a month were quietest, these operating at 86.1 per cent of normal production.

Koppers Construction Co. is designing and building an addition to the Becker oven plant of the Consolidated Gas Co. at Hunts Point, N. Y. The addition will include 37 producer gas underfired Becker ovens with a daily coal capacity of approximately 900 tons.